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ABSTRACT

Each year, comparable and comprehensive data about all of the nation's public elementary and secondary schools, local education agencies (LEAs), and state education agencies (SEAs) are collected through administration of the Common Core of Data (CCD) Surveys. This report summarizes CCD data for a period (1986-87 to 1990-91) during which major changes were occurring in the demographics of the nation's public school population. Enrollments in public schools began increasing after a decade of decline. The racial-ethnic composition of the student population was also changing, with notable increases in the numbers of Hispanic children enrolling in public schools. The report focuses on systemic educational responses to these demographic changes and reform pressures. Some of the findings are as follows: Enrollments in public schools rose by 3 percent and the average enrollment in existing school districts also increased. The number of schools with the prototypical middle-school grade range (6-8) increased by 23 percent, while the number of schools with the prototypical junior-high grade range (7-9) decreased by 20 percent. Over three-fourths of the growth in the number of students can be attributed to an increase in the number of Hispanic and Asian students. A school district's racial composition was strongly associated with its socioeconomic status. Two indicators--the index of racial imbalance and the index of minority exposure--provided slight evidence of desegregation improvements. Student-teacher ratios declined by 5 percent. Two figures and 43 tables are included. Appendices contain a glossary and methodological notes. (Contains 53 references.) (LMI)

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Trends in School District Demographics, 1986-87 to 1990-91

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Statistical Analysis Report April 1996

Trends in School District Demographics, 1986-87 to 1990-91

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Executive Summary

Overview

Each year, comparable and comprehensive data about all of the nation's public elementary and secondary schools, local education agencies (LEAs), and state education agencies (SEAs) are collected through administration of the Common Core of Data (CCD) Surveys. This report summarizes CCD data for a period (1986-87 to 1990-91) during which major changes were occurring in the demographics of the nation's public school population.[1] Enrollments in public schools began increasing after a decade of decline. The racial-ethnic composition of the student population was also changing, with notable increases in the numbers of Hispanic children enrolling in public schools.

This was also a period characterized by efforts to reform and improve the nation's education system. In response to these demographic changes and reform pressures, the nation's education system underwent numerous changes. These changes and the associated systemic responses are the focus of this report.

Summary of Findings

How has the population served by public schools changed in size, and how have school districts responded to the changes?

After enrollment in American public elementary and secondary schools reached a 20-year low in the mid-1980s, this trend was reversed: Between 1987-88 and 1990-91, enrollments rose by 3 percent. At the same time, the number of school districts declined slightly, with the result that the average enrollment in existing school districts increased. Other relevant findings include the following:

- In 1990-91, over half of the regular school districts in the nation served fewer than 1,000 students, but only 7 percent of the nation's public school students were enrolled in these small districts.

- From 1986-87 to 1990-91, the number and proportion of students in predominantly (at least 80 percent) white school districts decreased; the number and proportion of students in other districts increased.

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[1] Most analyses in this report are for the 1987-88 to 1990-91 period rather than the 1986-87 to 1990-91 period. Analyses in which the proportion of minority students (in a district or school) were employed as a descriptive factor were restricted to the shorter period. This was due to the fact that racial-ethnic data were not incorporated into the CCD until 1987-88.

Districts respond to changes in enrollments in a number of ways. One of the most basic ways is through changes in grade structure—that is, changing the grade levels served.

- From 1987-88 to 1990-91, the most common type of change in a district's grade structure was the addition of prekindergarten classes, followed by the elimination of prekindergarten classes.

Besides the addition and elimination of prekindergarten classes, districts tended to be stable with respect to the grade levels of students served. Between 1987-88 and 1990-91, only about 2.7 percent of the nation's school districts per year changed the grade levels of students they served.

How have the grade structure and the program specialization of public schools changed in response to changing needs?

Although districts are relatively stable with respect to the grades served, many districts respond to changing birthrates and changing parent concerns through changes in grades served by each school. Each year from 1986-87 through 1990-91, about one-eighth of the nation's public schools changed grade spans (i.e., the grade range of students that were enrolled at the school). Most of these changes were relatively minor, but about 2 percent of schools changed from one type of school (elementary, middle, secondary, or combined) to a different type.

Changes in the prevalence and grade spans of separate middle grade schools serving only early adolescent students were substantial during this period. Based on the observation that needs of early adolescents and preadolescents are very different from those of later adolescents, many districts restructured the grade spans of their schools to create schools that would only serve pre- and early adolescent students. The proportion of sixth, seventh, and eighth graders attending these schools increased from 1986-87 to 1990-91.

In this report, middle grade schools include the prototypical junior high school (grades 7-9) because junior high schools serve populations that are predominantly, or almost exclusively, pre- and early adolescent. However, some of the focus of the middle school movement has been on the movement of the sixth grade into middle schools and the ninth grade into high schools. From 1986-87 to 1990-91, the number of schools with the prototypical junior high school grade range (7-9) decreased by 20 percent, while the number of schools with the prototypical middle school grade range (6-8) increased by 23 percent. These changes allowed high schools to remain open as the high-school-age population declined during this period; these changes also addressed elementary school crowding as the population size of this age group grew.

Separate schools for middle grade, early adolescent students were most prevalent in large school districts, which tend to be urban and suburban and in the most affluent districts. Although there were a variety of different grade spans in these separate middle grade schools, almost all of them enrolled seventh-grade students. The higher the socioeconomic status (SES) of a district, the greater was the likelihood that their seventh graders attended separate middle grade schools.

What is the racial-ethnic composition of the populations served by public schools, and how has it changed?

CCD data were used to determine demographic trends, as well as to identify the types of schools and districts undergoing the greatest changes in their racial-ethnic composition from 1987-88 to 1990-91.

- The number of students in public elementary and secondary schools in regular school districts in the United States increased by approximately one million from 1987-88 to 1990-91. Over three-quarters (78.5 percent) of this growth can be attributed to an increase in the number of Hispanic (645,000) and Asian (140,000) students.

- The overall proportion of minority public school students in regular school districts steadily increased from 1987-88 to 1990-91. However, the proportion of black students, like the proportion of white non-Hispanic students, declined.

- In 1990-91, the number of Hispanic students exceeded the number of white non-Hispanic students in schools in large cities. White non-Hispanic students comprised about one-quarter (26 percent) of the public school students in large cities' schools.

- Most of the nation's minority students were served by school districts with enrollments of 10,000 or more.

- Each year from 1987-88 to 1990-91, the concentration of black students in special education schools, vocational education schools, and alternative education schools was greater than in regular schools; the concentrations of white and Asian students were lower in these schools.

- A district's racial composition (i.e., the proportion of minority students) was strongly associated with its socioeconomic status. The proportion of white non-Hispanic students was highest in the most affluent districts and was lowest in the poorest districts.

How have school districts responded to changes in racial-ethnic composition?

There is substantial evidence that education outcomes are related to the racial composition of classrooms and schools (Coleman et al. 1966; Mahard and Crain 1983). Many desegregation programs have been developed and implemented to ensure equal education opportunities for all races and ethnic groups. As previously noted, the period from 1987-88 to 1990-91 was characterized by substantial changes in the overall racial-ethnic composition of the school population. In order to investigate the net result of these changes and of districts' responses to them, it is necessary to employ indicators of within-district racial balance. These indicators—the index of racial imbalance and the index of minority exposure—are intended to show how white and minority students are distributed among the schools in a district. These indices provide indicators of the impacts of school districts' pupil assignment practices, showing how evenly white non-Hispanic students are spread amongst the districts' schools and whether these practices resulted in schools becoming more or less racially balanced.

- Both indicators provided slight evidence of desegregation improvements from 1987-88 to 1990-91.
- To achieve perfect racial balance in the typical urban school district (in 1990-91), over one-quarter of the minority students would have had to be reassigned to other schools in the district.
- The typical minority student in a large city school attended a school in which only about one-quarter (26 percent) of the students were white.
- The districts with the most racially imbalanced schools were those with the highest overall proportions of minority students in 1987-88. Improvements in these districts' racial balance from 1987-88 to 1990-91 were minimal, at best.
- The proportion of white students in the typical minority student's class—the minority exposure index—was highest in the most affluent school districts. However, the proportion of white students in the typical minority student's school decreased the most (that is, became much smaller) in the most affluent districts from 1987-88 to 1990-91.

How have student/teacher ratios changed?

Some believe that small(er) class sizes are generally better than larger class sizes because more individualized attention can be given to each student (Finn and Achilles 1990; Slavin 1989; Glass and Smith 1979).[2] In order to determine whether class sizes were decreasing in the nation's public schools, and to determine the types of districts realizing these changes, student/teacher ratios in different types of school districts were compared over time. Although class size and student/teacher ratios are not identical, student/teacher ratios are generally believed to be highly associated with class size. These comparisons are also informative about changes in resource distribution policies and practices, both over time and as a function of district characteristics. A decline in student/teacher ratios of 5 percent from 1986-87 to 1990-91 was noted, supporting the belief that class sizes have declined over this period.

- Student/teacher ratios were associated with certain district characteristics. For example, they were lowest in the smallest districts, in rural districts, and in the most affluent districts.
- Student/teacher ratios were highest in districts with the highest proportion of minorities. This was true even when other district characteristics were controlled through use of multivariate analytic techniques.

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[2] For a contrasting opinion, see Tomlinson, T. (1988). *Class Size and Public Policy: Politics and Panaceas.* U.S. Department of Education, Office of Educational Research and Improvement, PIP 88-838.

- Within districts, student/teacher ratios were also a characteristic of the type of school that a student attended. Higher student/teacher ratios were characteristic of:
  - elementary schools (in contrast to middle grade schools and secondary schools);
  - larger high schools (rather than smaller high schools); and
  - regular high schools (rather than specialized high schools).

Conclusion

Although the Common Core of Data does not provide answers to complicated policy questions, it does provide a background for formulating policy research questions and for designing studies to find out how particular interventions have worked in the context of the ever-changing schools and students in America. In one form or another, CCD data have been summarized in previous reports; however, these reports have not been used to examine in detail how our nation's schools have changed over a 5-year period. This period can also serve as a benchmark against which the magnitude of future changes can be compared.

CCD data cannot be used to address the question "Why?" However, by demonstrating the presence of significant changes and by identifying where these changes are occurring, policymakers and practitioners can better target their efforts. Researchers can develop specific hypotheses and can be much more sharply focused when addressing key research issues.

Introduction

Overview

The Common Core of Data (CCD) Surveys are annual data collection efforts sponsored by the U.S. Department of Education's National Center for Education Statistics (NCES). In administering these surveys, NCES provides State Coordinators with a common set of definitions for all of the informational items being requested. In this fashion, comparable and comprehensive information on all public elementary and secondary schools, local education agencies (LEAs), and state education agencies (SEAs) can be provided.

The types of data reported in these surveys include the following:

- General directory information, such as names, addresses, and telephone numbers.
- Basic demographic information, such as the numbers of students, by grade, race-ethnicity, and overall; numbers and types of high school completers; numbers of teachers; and percentages of students who are eligible for participation in the free or reduced-price lunch program.
- In a separate component, not covered in this report, fiscal data, such as revenues and expenditures, are aggregated at the state level.

This report focuses on the last half of the 1980s—including the 5 school years from 1986-87 through 1990-91—a period in which demographic changes in the American youth population interacted with changing concerns and expectations for the effectiveness of public schools in America. Demographically, a major change during this period was a reversal of a decade-long decrease in the number of children in the nation's schools. The smallest cohort in many years, the birth cohort of 1975, passed through the school system and was followed by larger cohorts. Thus, local, state, and federal policies responsive to decreasing school populations in the early 1980s had to be superseded by policies responsive to an increasing population. For individual schools and districts, these policies relate to opening and closing schools and changing from reductions in the teaching force to expansions to match increasing numbers of students. State education agencies were faced with considerations of consolidating districts where populations fell and creating new districts where populations rose.

Local districts juggled the grade-level spans of their schools to match both changing percentages of younger and older students and changing views on the appropriateness of separate schools for children at various stages of preadolescence and adolescence. Competing factors affected school board decisions to create junior high schools or middle schools and which grades to include in these schools.

This was also a period of continuing ethnic shifts in the American population, especially with a growing Hispanic population, as well as a period of continuing attempts to promote racial desegregation in schools with federal initiatives such as the Magnet Schools Assistance Program.

Movements continued between regions of the country and between types of communities, with the result that effective policies in one community might be inappropriate in another.

This period also started with great concern about declining test scores and graduation rates and an erosion of expectations for what skills and achievements high school graduation should imply (for example, Alexander and James' *A Nation at Risk*, 1983). This concern was heightened by projections that the nation's supply of qualified teachers would become inadequate to deal with the demands of the 1990s (Good and Hinkel 1983; Darling-Hammond 1984). At the same time, there was growing awareness of challenges that many children face and the need to provide special, individualized (but mainstreamed when possible) education programs for these children.

Based on the combination of 5 years of objective data on virtually all of the nation's public schools, this descriptive report provides a basic picture of the public education system's response to these changing demographic and political factors. It provides a baseline and historical background for those who would evaluate trends in American public schools in the 1990s. While the CCD does not provide answers to complicated policy questions, it does provide a background for formulating policy research questions and for designing studies to find out how particular interventions have worked in the context of the ever-changing schools and students in America.

In providing this descriptive background, the authors have found it necessary to go beyond simple crosstabulations to avoid misleading conclusions. In some cases, widely recognized derived statistics, such as a racial imbalance index, are used, and in other cases, breakdowns of statistics by different groupings of school districts are supplemented by tables that separate effects that are correlated in the population. For example, small schools and rural schools tend in many cases to be the same schools, and finding that small and rural schools have lower student/teacher ratios does not indicate which is the critical factor—school size or community type. By adding tables that show the effect of each of these, holding the other constant, one can find that school size, not community type, is the major correlate of student/teacher ratios.

The 1986-87 to 1990-91 data series were employed to examine changes in the nation's public education system through both time-series analyses (which compare the population of schools in one year to the population of schools in another year) and longitudinal analyses (which display the number of schools that make particular changes from one year to another over the 5-year period).[1] Time-series analyses permit assessment of overall changes in the picture of American schools, but comparisons must be interpreted cautiously, noting that a slightly different set of schools and districts are included each year. Longitudinal analyses, which look at the same school repeatedly, permit identification of the schools and districts that have undergone the greatest changes. Both types of information can prove invaluable for policymakers, practitioners, and researchers.

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[1] Most analyses in this report are for the 1987-88 to 1990-91 period rather than the 1986-87 to 1990-91 period. Analyses in which the proportion of minority students (in a district or school) were employed as a descriptive factor were restricted to the shorter period. This was due to the fact that racial-ethnic data were not incorporated into the CCD until 1987-88.

In one form or another, CCD data have been summarized in previous reports. However, these data have not been used to examine in detail how our nation's schools have changed over a 5-year period. This report presents policy-relevant information about how the nation's education system has changed from 1986-87 to 1990-91, to address the following questions:

- How has the population served by public schools changed in size, and how have school districts responded to the changes?
- How have the grade structure and the program specialization of public schools changed in response to changing needs?
- How has the population served by schools changed in race-ethnicity?
- How has the racial distribution of students within school districts changed?
- How have student/teacher ratios changed?

The sizes of changes from 1986-87 to 1990-91 and the types of schools and districts in which change was the greatest are identified and described.

Data Sources and Procedures

The major source of data used to address the above questions was the school and agency files contained on the CD-ROM, *CCD, Common Core of Data, 1986/87 - 1991/92,* developed by CTMG Publishers for the National Center for Education Statistics, Office of Educational Research and Improvement, U.S. Department of Education. Information about socioeconomic status (SES) was abstracted from the 1990 data collected by the U.S. Bureau of the Census mapped by school district, as provided on the CD-ROM, *School District Data Book Version 1.0, June 1994*. The resulting data set permits comparisons of schools and districts with respect to a full set of student, district, and community characteristics. Data sources and procedures are described in more detail in Appendix A.

Two types of procedures were used to analyze these data:

- Comparisons of the measures of interest in schools, districts, and communities with specific characteristics
- Comparisons of these measures holding other factors constant

The first approach is presented in the form of cross-tabulations of simple descriptive statistics. For example, the proportion of Native American, Asian/Pacific Island, Hispanic, black non-Hispanic, and white non-Hispanic children in schools and districts of different sizes are presented on a year-by-year basis. This allows for comparison between schools and districts of different sizes and permits identification of how different kinds of districts and schools have changed over time.

The second approach shows the impact of each individual district (or school) factor on the dependent measure being discussed (such as student/teacher ratios or racial balance measures) in districts (or schools) that are similar on other factors. This type of multivariate analysis indicates how simple two-way relationships between variables (e.g., student/teacher ratios and district metropolitan status) can be better explained by taking other factors into account (e.g., district size). The utility of the multivariate analyses for providing a more complete understanding of the true relationships among the variables presented in this report is illustrated in table 5.9. This table shows the differing results that can be obtained through the use of simple bivariate and multivariate analyses: Although the bivariate results in this table, displayed in the column labeled "student/teacher ratio (1987-88)," show a positive relationship between student/teacher ratios and metropolitan status, the multivariate data, displayed in the column labeled "equated mean ratio (1987-88)," show a different relationship between these variables. This is due to the fact that although the bivariate results combine both direct and indirect relationships between these two variables, the multivariate analyses remove the indirect relationships that are due to mutual correlations with other factors by taking simultaneously into account the effects of a number of variables believed to be relevant to variations in student/teacher ratios. Thus, while the bivariate analysis suggests a simple positive relationship between these two variables, the multivariate analysis indicates that this result is really an artifact of the relationship between district size, the percentage of minority students, the percentage of students in poverty, and district urbanicity. The multivariate analysis shows that when the relationship between all of these related variables and student/teacher ratios are considered simultaneously, districts in urban/central cities have the lowest student/teacher ratios rather than the highest.

In most cases, the data presented in this report are weighted by the number of students in the reporting entity. For example, table 3.1 indicates that 69.3 percent of public school students in regular districts in 1987/88 were white non-Hispanic. Since this result is weighted by the number of students, it means that 69.3 percent of the total student enrollment in these types of districts were white. Adding up the proportions of white students in each district and dividing by the number of districts would produce a different result. In some cases, there are reasons for presenting data weighted at the district level. For example, racial imbalance measures are a characteristic of a district—of interest is how this measure has changed for the average district, irrespective of the district's enrollment. These tables are clearly indicated in the report.

Types of districts studied. Policymakers, practitioners, and researchers recognize a tremendous heterogeneity between different schools and districts within the United States. The problems and characteristics of schools and districts outside of the 50 states and the District of Columbia further increase this diversity. Since the demographic composition, governance structures, and student populations of these education systems is quite different from those of the 50 states and D.C., they were excluded from analyses.[2]

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[2] Many of the issues being addressed are also of lesser relevance in the noncontinental commonwealths and trust territories (e.g., desegregation trends in Guam and Puerto Rico). Since the inclusion of noncontinental commonwealths and trust territories could skew results, schools and districts outside of the 50 states and the District of Columbia were excluded.

In nearly all cases, analyses were also restricted to what are commonly called "regular" school districts. Districts that are administrative centers, regional education service agencies, or state or federally operated institutions serving special needs populations were excluded from analyses. "Regular" districts comprised 92 percent of all school districts and served 99 percent of the public school student population. It was felt that the inclusion of other than regular school districts might skew results.

District and community variables. The district variables included in this report are the enrollment of the districts, the teachers, and the types of students they enroll. These student variables include the percentages of children who live in poverty (an indicator of district SES) and the percentages of children who are minority. The community measure employed is the type (metro status) of the community in which the district is located (i.e., urban, suburban, or rural). More detailed descriptions of the variables, and other terms used in this report, are included in Appendix A.

Types of schools studied. All schools in regular school districts were included in these analyses, including regular schools, special education schools, vocational education schools, and alternative education schools. (Magnet schools and specialty schools were included if they were in regular school districts. However, they might have been classified as alternative, regular, or vocational schools, depending on their theme, their instructional approach, and the judgment of the person responsible for classifying schools.) Results are generalizable to the universe of public schools in districts that were classified as regular school districts and to the students attending these schools.

School and community variables. The variables used to categorize schools, and that are used as controls in the multivariate analyses included in this report, are school enrollment; grade range; school type (regular, special education, vocational education, or alternative education); and the percentage of minority children. The community measure employed is the type (locale) of the community in which the school is located (i.e., large city, mid-size city, urban fringe of large city, urban fringe of mid-size city, large town, small town, and rural). Detailed descriptions of these variables, and other terms used in this report, are also included in Appendix A.

Organization of This Report

This report presents findings in five sections, based on the major questions listed in the introduction. The background descriptive information presented in each section raises many questions that are beyond the scope of the Common Core of Data to answer in itself, and some of these questions are included at the end of each section. Tables containing supplementary analyses and elaborations of the methodologies employed are presented in Appendix B.

1 How Did Public School District Enrollments Change From 1986-87 to 1990-91?

Overview

Public elementary and secondary school enrollment in America increased from about 25 million students in 1929-30 to a high point of 46 million in 1971-72, before decreasing to slightly fewer than 40 million in the mid-1980s. During the same interval, the number of school districts in the country decreased dramatically from 127,531 in 1931-32 (U.S. Department of Health, Education, and Welfare 1966) to 71,094 in 1951-52; 17,995 in 1971-72; and 17,051 in 1986-87 (National Center for Education Statistics 1978, 1993). Over the greatest part of the 20th century, the number of public school districts has declined, independent of rises and falls in enrollment. Has this tendency for consolidation continued in the last half of the 1980s? As Chambers (1981) points out, the increased costs of bureaucratization can outweigh savings associated with economies of scale. Certain districts (such as the City of Chicago School District and the Los Angeles Unified School District) are considering or have implemented major restructuring: decentralizing control and possibly splitting into several new school districts. To begin to study school district policy in the latter half of the 1980s, it is necessary to know where enrollments have risen and fallen and where numbers of school districts have increased and decreased.

Public elementary and secondary schools in the United States are governed, for the most part, by elected school boards; each board presides over a local school district, or to use the official term, "Local Education Agency" (LEA).[3] A large percentage of decisions affecting schools are generally made at the district level, such as teacher hiring and promotion, curriculum materials acquisition, scheduling, and capital expenditures. The district is the major administrative unit reporting information for the CCD, aggregating data from the schools it manages. The CCD includes a small number of districts as administrative units that have no directly associated schools. However, in the tables in this report, data are limited to regular school districts (i.e., state-operated and federally operated districts serving special needs populations, regional education service agencies, and administrative districts were excluded).

Summary of Findings

- *From 1986-87 to 1990-91, the number of students enrolled in regular public school districts increased by more than one million (about 3 percent).*

- *Over the same time period, the number of regular school districts in the country continued to decline at a slow rate.*

- *In 1990-91, over half of the regular school districts in the nation served fewer than 1,000 students. Only 7 percent of the students in the United States were enrolled in these small districts.*

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[3] The term "district" will be used in place of "Local Education Agency (LEA)" in this report.

- *From 1986-87 to 1990-91, the number of students in predominantly (at least 80 percent) white non-Hispanic school districts decreased; the number and proportion of students in other districts increased. By 1990-91, three-fifths of the minority public school students in the country were in districts that were predominantly (at least 50 percent) minority.*

- *The most common type of change in a district's grade structure (from year to year) is the addition of prekindergarten classes, followed by the elimination of prekindergarten classes.*

- *Changes in grade structure that did not involve the addition or deletion of prekindergarten classes were a function of district size. Most changes occurred in the smallest districts; no changes occurred in the largest districts.*

Detailed Description of Findings

Changes in numbers of public school districts and in numbers of students. In 1990-91, America had 40,894,656 elementary and secondary students in 15,358 regular school districts (an average of 2,663 students per district).[4] Most public school districts served children in grades kindergarten through 12 as shown in table 1.1, although there were also many separate elementary and secondary school districts. As shown in this table, data on grade span were not available in the Common Core of Data for all regular school districts during this period, sometimes because all of their schools were reported as "ungraded"; and some districts (e.g., ranch schools) reported no student enrollment in some years. In view of the possibility that reductions in numbers of school districts might represent consolidations (for example, of elementary and secondary districts to create unified districts), it is of interest that the numbers of elementary, secondary, and unified school districts serving all grades declined during the last half of the 1980s.

Table 1.1— Number of regular districts serving students at different grade levels: 1986-87 to 1990-91

		Grade Levels Served				
	Number of Districts	Elementary	Secondary	Unified	Unknown	No Students
1986-87	15,713	3,738	650	10,991	117	217
1987-88	15,577	3,728	628	10,778	168	275
1988-89	15,376	3,709	609	10,719	144	195
1989-90	15,367	3,687	604	10,726	118	232
1990-91	15,358	3,653	592	10,672	71	370

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

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[4] In addition to the 15,358 regular school districts (NCES types 1 and 2), there were 1,336 other administrative units classified as districts in the Common Core of Data in 1990-91, with a total enrollment of 490,786.

Enrollment sizes vary widely between school districts. As shown in table 1.2, over half of the districts in 1990-91 (53.8 percent) had fewer than 1,000 students each, while only about one-tenth (10.5 percent) had more than 5,000 students. On the other hand, as shown in table 1.3, those small districts (with fewer than 1,000 students each) only enrolled about 7 percent of the nation's students in 1990-91, while the large districts (with more than 5,000 students each) enrolled nearly two-thirds (62.3 percent) of the students. This wide variation in the enrollment size of school districts is primarily a result of the variation in population density throughout the nation; however, it has implications for the kinds of general resources that can be made available to teachers and the kinds of procedures that must be implemented to manage the teaching process. Therefore, trends in the sizes of districts, as well as trends in the overall number of students, are of interest.

A comparison of the numbers of students and districts from 1987-88 to 1990-91 shows that while the number of students rose by 3 percent over this period, the number of regular school districts fell by about 1.4 percent.[5] The decline in the number of school districts continued the long-term trend, which had been interrupted in the early 1980s.[6] The increase in total enrollment from 1987-88 to 1990-91 represents a continuation of the longer-term trend of increasing school enrollment, after the 15-year interruption between 1971 and 1986.

Table 1.2— Percentages of regular districts in different size categories: 1986-87 to 1990-91

		Size			
	Number of Districts	0 - 999	1,000 - 4,999	5,000 - 9,999	10,000 and over
1986-87	15,713	55.0	34.9	6.1	4.0
1987-88	15,577	54.8	35.1	6.0	4.1
1988-89	15,376	54.4	35.4	6.0	4.2
1989-90	15,367	53.9	35.8	6.0	4.3
1990-91	15,358	53.8	35.7	6.1	4.4

NOTE: Totals may not add to 100 percent due to rounding error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

Over the period from 1986-87 to 1990-91, the decrease in the number of districts was almost entirely among small districts. As shown in table 1.2, the percentage of regular districts that had fewer than 1,000 students fell by more than 1 percent, which translates into a drop of about 270 small districts. Although some districts may have discontinued operation because of a lack of students in the geographic area they served, others either increased in size and were reclassified into a larger size category or, more commonly, were consolidated or combined with another district to create a larger new or continuing district.

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[5] This report focuses on regular school districts. The Common Core of Data also collects information on administrative units that overlap regular school districts.

[6] The total number of operating school districts fell from 16,768 in 1971-72 to 15,538 in 1981-82, so there was a small increase in the number of districts during the first half of the 1980s. SOURCE: U.S. Department of Education. (1983). *The Condition of Education: 1983 Edition.* Washington, D.C.: National Center for Education Statistics, table 1.8).

Consolidation, as well as population growth in denser areas, led to an increase in the number of districts that had 10,000 students or more. The figures in table 1.2 indicate an increase of 46 between 1986-87 and 1990-91 in the number of these very large districts (from 633 to 679), which represents a 7 percent increase. As shown in table 1.3, this was matched by a 6 percent increase in the number of students in districts with 10,000 or more students. It is not the case that enrollment increased by 6 percent in each of these districts, but rather that enrollment increased by a (small) amount sufficient to place 46 additional districts in this category.

Table 1.3— Percentages of students in regular districts, by district size: 1986-87 to 1990-91

	Number of Students	Size			
		0 - 999	1,000 - 4,999	5,000 - 9,999	10,000 and over
1986-87	39,590,731	7.4	31.7	16.6	45.3
1987-88	39,657,272	7.4	31.4	16.4	44.7
1988-89	39,785,034	7.4	31.1	16.1	45.4
1989-90	40,241,704	7.3	31.1	16.0	45.7
1990-91	40,894,656	7.1	30.6	15.9	46.4

NOTE: Totals may not add to 100 percent due to rounding error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

District metropolitan status. School districts are associated with particular geographic areas, many with boundaries coinciding roughly or exactly with city boundaries. However, some cities have several districts within their boundaries, and many districts in rural areas span wide, often sparsely populated areas. Are increases in enrollment primarily found in urban districts, suburban districts, or non-MSA districts? Are consolidations of districts more frequent in non-MSA districts than in urban or suburban districts? The first question is addressed in tables 1.4 and 1.5, which show the distribution of urban, suburban, and rural districts. Large school districts tend to be in central cities. Roughly one-quarter of the nation's students are in the 3.8 percent of the nation's school districts that are in central cities; almost one-half of the students are in the 36 percent of districts that are in other cities and metropolitan areas; and the final quarter are in the 60 percent of districts that are in small towns or rural areas.

Very little change in the relative percentages of districts in urban, suburban, or rural settings occurred between 1987-88 and 1990-91, suggesting that consolidations were not specific to a particular setting. As noted above, most districts that consolidated were small; however, the small districts that consolidated were not, as might have been conjectured, primarily in small towns and rural areas.

Table 1.4— Percentages of regular districts with different metropolitan status: 1987-88 to 1990-91

	Number of Districts	Metropolitan status		
		Urban/ central cities	Suburban/ metropolitan	Rural (non-MSA)
1987-88	15,577	3.8	36.4	59.8
1988-89	15,376	3.8	36.3	59.9
1989-90	15,367	3.8	36.2	60.0
1990-91	15,358	3.9	36.3	59.9

NOTE: Totals may not add to 100 percent due to rounding error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

Table 1.5— Percentages of students and average enrollment size in regular districts, by metropolitan status: 1987-88 to 1990-91

	Number of Students	Metropolitan status					
		Urban/ central cities		Suburban/ metropolitan		Rural (non-MSA)	
		Percent	Size	Percent	Size	Percent	Size
1987-88	39,657,272	27.3	18,180	46.8	3,278	25.8	1,100
1988-89	39,785,034	27.3	18,531	46.9	3,342	25.9	1,117
1989-90	40,241,704	27.1	18,612	47.1	3,410	25.9	1,128
1990-91	40,894,656	27.0	18,574	47.4	3,479	25.6	1,138

NOTE: Totals may not add to 100 percent due to rounding error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

The growth in enrollment between 1987-88 and 1990-91, as shown in table 1.5, was primarily in suburban-metropolitan areas. Based on the percentages in table 1.5, the enrollment in these districts increased by about 800,000 over these 3 years, compared to about 200,000 each in central cities and rural-small town areas. The average enrollment in a school district in the suburban category rose from 3,278 in 1987-88 to 3,479 in 1990-91 (a 6 percent increase). In contrast, the average enrollment in central city (2 percent) and rural-small town districts (3 percent) grew little during this period. During this time, districts in the suburban areas, more than others, were dealing with growing enrollments and the space and staff allocation problems created as a result.

Racial-ethnic composition. Slightly more than 30 percent of students in public elementary and secondary schools in the United States are members of minority groups (see table 3.1). These students are not distributed uniformly across districts, however. As shown in table 1.6,[7] roughly half of the districts had fewer than 5 percent minority students in 1990-91, and nearly 10 percent had 50 percent or more minority students. The combined percentages in these extreme categories increased during the 1987-88 to 1990-91 period from 57.4 percent to 60.9 percent. Thus, whatever the progress in within-district desegregation during this period, the gap between districts may have widened slightly.

Table 1.6— Percentages of regular districts in different racial-ethnic composition categories: 1987-88 to 1990-91

	Number of Districts in Analysis	Percent Minority			
		0% - < 5%	5% - < 20%	20% - < 50%	50% and over
1987-88	15,162	48.5	27.8	14.7	8.9
1988-89	15,066	47.3	28.6	15.1	9.1
1989-90	15,049	48.6	27.3	14.8	9.3
1990-91	14,969	51.3	23.9	15.2	9.6

NOTE: Totals may not add to 100 percent due to rounding error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

On the other hand, the results in table 1.6 do not account for differences in district size—they give equal weight to large and small districts. A more important question concerns the number of students attending schools in districts with the highest and lowest concentrations of minority students (table 1.7). Students were roughly evenly split across the four levels of minority percentage defined in tables 1.6 and 1.7. However, the same was not true of minority students—most were in districts in which white non-Hispanic students were minority enrollment. In fact, three-fifths of minority regular public school students in America were in districts in which 50 percent or more of the students were minorities. This imbalance is discussed in greater detail in chapter 3.

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[7] The numbers of students and districts included in the analysis for these and other tables differ from the total number of districts because some variables were undefined. For example, in the case of tables 1.5 and 1.6, the percent minority was undefinable for districts with no students.

Table 1.7— Percentages of students, and of minority students, in regular districts, by district minority concentrations: 1987-88 to 1990-91

	Number of Students in Analysis	Percent Minority in Districts			
		0% - < 5%	5% - < 20%	20% - < 50%	50% and over
All students					
1987-88	39,645,526	22.8	26.8	24.8	25.6
1988-89	39,774,504	21.6	27.0	25.5	26.0
1989-90	40,231,972	22.0	26.3	25.6	26.2
1990-91	40,889,306	22.0	25.1	26.0	26.9
Minority students					
1987-88	12,117,820	1.7	9.7	27.0	61.6
1988-89	12,345,411	1.6	9.5	27.2	61.6
1989-90	12,654,210	1.6	9.4	27.3	61.7
1990-91	13,115,468	1.5	9.8	27.2	62.5

NOTE: Totals may not add to 100 percent due to rounding error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

Socioeconomic status (percentage of school-age children in poverty: 1990). The prevalence of poverty in a school district can be measured by the percentage of children who are reported as eligible for participation in the federal free or reduced-price school lunch program. The distribution of poverty between districts is shown in table 1.8, which indicates very little change in the relative number of districts in which poverty was prevalent between 1986-87 and 1990-91.

Table 1.8— Percentages of regular districts in different SES (percentage of population in poverty) categories: 1986-87 to 1990-91[a]

	Number of Districts in Analysis	Percentage of School-Age Children in Poverty: 1990			
		0% - < 5%	5% - < 15%	15% - < 25%	25% and over
1986-87	15,266	11.4	38.7	29.2	20.7
1987-88	15,232	11.4	38.7	29.1	20.8
1988-89	15,272	11.4	38.7	29.1	20.8
1989-90	15,367	11.4	38.7	29.2	20.7
1990-91	15,234	11.4	38.6	29.2	20.8

[a] Only districts for which SES data were available are included in these analyses.

NOTE: Totals may not add to 100 percent due to rounding error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91; U.S. Department of Education, National Center for Education Statistics, School Data Book Version 1.0, June 1994.

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During this 5-year period, student enrollments reached their lowest point during the 1987-88 school year, and increased by 1.2 million by 1990-91. However, as can be inferred from table 1.9, which shows the percentages of students in districts with varying degrees of poverty, this increase in the numbers of students was almost entirely found in districts with less than 25 percent of students eligible for the free or reduced-price school lunch program. Districts having between 5 and 15 percent of the students eligible were the districts in which the greatest enrollment increases occurred.

Table 1.9— Percentages of students in regular districts, by district SES (percentage of population in poverty): 1986-87 to 1990-91[a]

	Number of Students in Analysis	Percentage of School-Age Children in Poverty: 1990			
		0% - < 5%	5% - < 15%	15% - < 25%	25% and over
1986-87	39,590,731	10.6	34.4	27.5	27.5
1987-88	39,497,467	10.7	34.4	27.5	27.4
1988-89	39,741,340	10.8	34.5	27.6	27.1
1989-90	40,241,704	10.8	34.8	27.7	26.8
1990-91	40,882,320	10.9	34.9	27.7	26.6

[a] Only districts for which SES data were available are included in these analyses.

NOTE: Totals may not add to 100 percent due to rounding error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91; U.S. Department of Education, National Center for Education Statistics, School Data Book Version 1.0, June 1994.

Trends in grade structures of school districts. School districts serve different grades, but they generally serve the same grades from year to year even though they may change the distributions of grades among schools to accommodate changing birth rates and in- and out-migration. An examination of the Common Core of Data from 1987-88 to 1990-91 indicates that the most frequent grade-level changes at the school-district level occurred in the addition of prekindergarten classes. As shown in table 1.10, over 3 percent of districts added prekindergarten from 1987-88 to 1988-89. In each of the following 2 years, the percentage increased, and by 1990-91, more than 6 percent of school districts added prekindergarten.[8]

The grade span of a district is defined in CCD as the range from the lowest to the highest grade in which students are enrolled in a school in the district. It might be asked whether these changes in grade span merely reflected changing enrollments in small districts—for example, in some years, there were 4- or 5-year-olds in the district, and in other years, there were not. To address this question, percentages excluding districts with fewer than 100 students are also shown in table 1.10. The addition of prekindergarten appears to be as frequent in larger districts as in the very smallest districts.

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[8] It should be noted that CCD data for 1986-87 included substantially more districts reported as serving prekindergarten. Those data are not included in the table because of concern over their validity. Also, it should be noted that in a small number of districts for some years the reported low grade and high grade were "00." Those districts are counted as "no change" in these analyses.

The addition of prekindergarten to the scope of public elementary and secondary school-district responsibility was not a consistent trend during the late 1980s, however. In each of the 3 years shown in table 1.10, about 3 percent of the districts reported that they discontinued responsibility for prekindergarten.

The next most frequent grade-span change involved kindergarten. However, as shown in table 1.11, unlike the prekindergarten changes, the additions and deletions of kindergarten were limited mainly to small school districts (those with fewer than 1,000 students). Between 1 and 2 percent of the small districts added kindergarten each year, and roughly the same number dropped kindergarten. By comparing the numbers of districts adding or deleting kindergarten with the numbers of students in those districts (fewer than 1 percent of all students in small districts), one can infer that the schools that made these changes tended to be among the smallest in the small districts (table 1.12). That is, many of the changes in offering kindergarten may have been made in response to the number of 5-year olds in the community. Finally, except in small districts, there were very few other changes in grade span, such as changes that would occur if an elementary and secondary district combined to create a unified district.

Table 1.10— Percentages of districts and students in districts that made grade-span changes: 1987-88 to 1990-91

		Grade-Span Change					
	Number of Cases in Analysis	Added KG	Added preKG	Deleted KG	Deleted preKG	No Change	Other Change
Total							
Percentages of districts							
1987-88 to 1988-89	15,334	1.1	3.5	0.9	2.9	88.9	2.8
1988-89 to 1989-90	15,272	1.1	5.4	0.9	2.4	87.5	2.6
1989-90 to 1990-91	15,234	0.9	6.8	0.8	3.1	85.8	2.6
Percentages of students							
1987-88 to 1988-89	39,954,000	0.2	3.6	0.1	2.2	93.9	0.2
1988-89 to 1989-90	39,740,000	0.1	7.0	0.0	1.6	91.0	0.2
1989-90 to 1990-91	40,210,000	0.1	6.5	0.1	4.1	88.9	0.2
Excluding districts with fewer than 100 students							
Percentages of students							
1987-88 to 1988-89	13,456	0.4	3.8	0.2	3.1	91.9	0.7
1988-89 to 1989-90	13,451	0.3	6.0	0.1	2.6	90.2	0.7
1989-90 to 1990-91	13,409	0.2	7.5	0.2	3.4	88.1	0.8
Percentages of students							
1987-88 to 1988-89	39,947,000	0.2	3.6	0.0	2.2	93.9	0.2
1988-89 to 1989-90	39,680,000	0.1	7.0	0.0	1.6	91.0	0.2
1989-90 to 1990-91	40,150,000	0.1	6.5	0.1	4.2	88.9	0.2

NOTE: Totals may not add to 100 percent due to rounding error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

Table 1.11— Percentages of districts that made grade-span changes, by size: 1987-88 to 1990-91

		Grade-Span Change					
	Number of Districts in Analysis	Added KG	Added preKG	Deleted KG	Deleted preKG	No Change	Other Change
Size							
0 - 999							
1987-88 to 1988-89	8,326	1.8	3.3	1.5	3.4	85.0	5.0
1988-89 to 1989-90	8,277	1.8	4.5	1.7	2.7	84.8	4.6
1989-90 to 1990-91	8,157	1.5	6.6	1.3	3.0	83.0	4.6
1,000 - 4,999							
1987-88 to 1988-89	5,437	0.3	3.6	0.2	2.4	93.4	0.3
1988-89 to 1989-90	5,421	0.3	6.2	0.1	2.1	91.1	0.2
1989-90 to 1990-91	5,493	0.2	7.0	0.2	3.1	89.2	0.4
5,000 - 9,999							
1987-88 to 1988-89	936	0.2	3.5	0.0	1.8	94.3	0.1
1988-89 to 1989-90	923	0.2	6.9	0.0	2.3	90.4	0.2
1989-90 to 1990-91	924	0.1	7.9	0.0	3.3	88.4	0.3
10,000 and over							
1987-88 to 1988-89	635	0.2	4.6	0.0	2.7	92.6	0.0
1988-89 to 1989-90	651	0.0	10.0	0.0	1.4	88.6	0.0
1989-90 to 1990-91	660	0.2	6.5	0.2	4.7	88.5	0.0

NOTE: Totals may not add to 100 percent due to rounding error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

Table 1.12— Percentages of students in districts that made grade-span changes, by size: 1987-88 to 1990-91

		Grade-Span Change					
	Students (Millions) in Analysis	Added KG	Added preKG	Deleted KG	Deleted preKG	No Change	Other Change
Size							
0 - 999							
1987-88 to 1988-89	2.91	0.6	3.8	0.2	3.9	90.5	1.1
1988-89 to 1989-90	2.92	0.3	5.8	0.2	3.1	89.6	1.0
1989-90 to 1990-91	2.90	0.2	8.0	0.2	3.6	86.9	1.1
1,000 - 4,999							
1987-88 to 1988-89	12.39	0.2	3.4	0.2	2.5	93.5	0.3
1988-89 to 1989-90	12.36	0.3	6.2	0.1	2.1	91.0	0.3
1989-90 to 1990-91	12.51	0.1	7.3	0.1	3.0	89.0	0.3
5,000 - 9,999							
1987-88 to 1988-89	6.50	0.2	3.6	0.0	1.7	94.5	0.1
1988-89 to 1989-90	6.40	0.2	7.0	0.0	2.3	90.3	0.2
1989-90 to 1990-91	6.41	0.1	8.1	0.0	3.4	88.0	0.4
10,000 and over							
1987-88 to 1988-89	17.74	0.1	3.6	0.0	1.9	94.5	0.0
1988-89 to 1989-90	18.05	0.0	7.7	0.0	0.8	91.5	0.0
1989-90 to 1990-91	18.39	0.2	5.2	0.1	5.3	89.4	0.0

NOTE: Totals may not add to 100 percent due to rounding error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

Questions for Further Research

Examination of Common Core of Data results both longitudinally and as a time-series across the 5-year period from 1986-87 to 1990-91 reveals some clear patterns in American public education, and at the same time raise questions about the causes and the effects of changes that occurred over this period.

In 1987-88, enrollment in American public elementary and secondary schools reached a 20-year low, and enrollments rose by 3 percent between 1987-88 and 1990-91. At the same time, the number of school districts declined slightly, resulting in the rise in average enrollment in existing school districts. The growth in average enrollment was largest in suburban metropolitan school districts—over 6 percent. This leads one to wonder:

> *At what point will rising enrollments fill in the empty desks that resulted from 15 years of declining enrollment and bring into play pressures for building new schools and adding teachers?*

In terms of consolidation of school districts, the number of small districts continued to decline, and the number of very large districts increased. During this period, one pattern of consolidation, combinations of separate elementary and secondary districts into unified districts, did not appear to be prevalent. In fact, the number of unified districts also declined. One is led to consider:

> *Is there an inevitable process of attrition of small districts as the needs for more sophisticated education equipment, materials, and communication technology increase?*

In terms of demographics, the percentages of districts serving either fewer than 5 percent minorities or more than 50 percent minorities increased slightly between 1987-88 and 1990-91. (Issues concerning trends in racial balance and interracial exposure are examined in chapter 3.)

> *Is separation between white non-Hispanic students and minority students increasing, or is this trend merely a characteristic of school districts as an administrative reporting unit?*

Finally, in each year from 1987-88 to 1990-91, many school districts, large and small, either added or deleted prekindergarten. Because policies on including prekindergarten children in public schools remain variable, one wonders:

> *Is this an artifact of reporting, or are many districts experimenting with the addition of prekindergarten programs to their public school systems?*

The fact that substantial numbers of districts appear to have deleted prekindergarten each year suggests that such experiments may not always have been successful. If so:

> *What factors are related to choices to add prekindergarten and choices to retain it, once added?*

2 How Has the Specialization of Schools, by Grade Levels and Program Type, Changed?

Overview

Although school districts constitute an important administrative unit, the most important organization of instruction occurs at the school level. School organization reflects many factors, including the following:

- ages of the populations served
- policy on separate middle grade schools for early adolescent students
- policy on school size
- policy on separate schools focusing on special education, vocational education, and other alternatives (i.e., magnet schools)
- constraints on school size (e.g., existing buildings, capital budgets)

Several current education reforms and models are concerned with specialization—that is, the delivery of services to particular groups of students based on commonalities of ages, interests, needs, and/or abilities. Certain outcomes of these reform efforts—changes in the numbers of students receiving special services or attending special schools, and changes in the numbers of special schools—can be directly determined by information available in the CCD Surveys. Similarly, the types of school districts that have undergone the greatest changes in these areas can be identified.

Grade-Level Specialization

As a reform, grade-level specialization is manifested through reform efforts such as the middle school movement. Its origins have been attributed to an earlier reform introduced in the early 1900s—the establishment of junior high schools—to prevent eighth-grade dropouts and to prepare students for the semiskilled occupations of the day. By 1971, 31.4 percent of the nation's public schools were junior high schools (U.S. Department of Health, Education, and Welfare 1971). However, as early as the 1930s, junior high schools were criticized as a failed reform, and by the 1960s, a new wave of policy talk encouraged the development of schools more sensitive to the needs of early adolescents (especially sixth graders). These newer schools, called middle schools, recognized the fact that preadolescents were very different from adolescents, and these middle schools were intended to respond to the diversity of needs of 10- to 14-year-olds (Cuban 1992). City school systems rapidly adopted this reform; the number of grades 5-8 and 6-8 schools rose from fewer than 11 before 1960 to 5,466 in 1987 (Alexander and McEwin 1989).

In spite of the belief that the increase in the prevalence of middle schools was catalyzed by an inability of junior high schools to serve the needs of early adolescents, both the typical junior high school (grades 7-9) and the typical middle schools (grades 5-8 and 6-8) serve populations that consist primarily or exclusively of early adolescents. There is no firm agreement about what grade ranges should be served by these separate middle grade schools.[9] Building on the middle school principle of trying to meet the special needs of young adolescents, schools with grade ranges consisting primarily or exclusively of young adolescents (between the ages of 10 and 15) were identified. This enabled investigation of the proportions of young adolescents attending separate middle grade schools, distinct from either elementary schools or high schools, and of the prevalence and distribution of this type of school. For this report, schools whose lowest grade was fourth or higher and whose highest grade was seventh, eighth, or ninth are referred to as separate middle grade schools for early adolescents.[10]

To develop an indicator of the amount of grade-level specialization, the proportions of students in specific grades that were attending these separate middle grade schools were determined. The place of enrollment of seventh graders was chosen as a reference point because in nearly every school district with separate middle grade schools, seventh graders attended those schools. Using this indicator, one can ask: How have the proportions of seventh graders attending schools that consist primarily or exclusively of young adolescents (and that do *not* serve older students or very young students) changed over time? In the school classification schema developed (see Appendix A, table 1), the seventh grade was included in over 98 percent of the schools categorized as separate middle grade schools in 1990-91—more than any other grade.

CCD data were analyzed to answer the following questions:

- How has the number of separate middle grade schools, as well as the number and proportion of students enrolled in these schools, changed over this time period?
- How have the grade spans of separate middle grade schools changed over time?
- What types of school districts are most likely to have separate middle grade schools?

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[9] The National Middle Schools Association prefers to define middle schools on the basis of the school's educational philosophy. They maintain that middle schools are intended to serve young adolescents—that is, youth between the ages of 10-15—and to support their healthy growth and development. Their criteria for determining whether a school serving seventh-ninth graders should be considered as a middle school are programmatic and philosophical rather than age-driven. SOURCE: National Middle Schools Association. (1995). *What is a Middle School?* Columbus, Ohio: Author.

[10] Our categorization of schools is intended only for reporting the prevalence of districts in which there are separate middle grade schools for early adolescent students. Both junior high schools (which are included in this category) and middle schools (as conceptualized by education reformers) represent grade-level specialization.

- How prevalent are changes in schools' grade structures?
- In what kinds of districts are these changes most likely to occur?

Methodology

Schools were categorized as elementary, middle, secondary, or combined based on the grade range of students served. (See Appendix A for the classification schema.) Figure 2.1 identifies the criteria employed. For example, a school serving a low grade between 4 and 7 and serving a high grade between 7 and 9 would be considered a separate middle grade school. Using this definition, 15 percent of the nation's schools in regular districts in 1990-91 were separate middle grade schools.

Figure 2.1— Classification of separate middle grade schools by grades served

		Highest Grade		
		7	8	9
Lowest Grade	4	**Middle**	**Middle**	**Middle**
	5	**Middle**	**Middle**	**Middle**
	6	**Middle**	**Middle**	**Middle**
	7	**Middle**	**Middle**	**Middle**
	8		**Middle**	**Middle**
	9			**Middle**

Analyses concerned with other changes in the grade structure of schools within a district used a broad definition of change: Any change in the grade range of students served meant that the school had changed its grade span. This definition included both relatively minor changes, as from K-5 to K-6 as well as major restructuring, such as 7-9 becoming 7-12. To distinguish these types of changes, the term "grade-structure change" was developed to refer to any school that changed from one type (e.g., elementary, secondary, middle, or other) to another.

Summary of Findings

- *The proportion of students attending separate middle grade schools for early adolescents continued to increase from 1986-87 to 1990-91. In 1986-87, only 37.4 percent of sixth graders and 81.6 percent of seventh graders enrolled in regular school districts attended separate middle grade schools. By the 1990-91 school year, 45.4 percent of sixth graders and 83.3 percent of seventh graders enrolled in regular school districts were attending one of the nation's 12,411 separate middle grade schools.*

- *While the number of schools with the prototypical junior high school grade range (7-9) decreased by 20 percent from 1986-87 to 1990-91, the number of schools with the prototypical middle school grade range (6-8) increased by 23 percent.*
- *During this time period, separate middle grade schools were more prevalent in large school districts, which tend to be urban and suburban.*
- *Separate middle grade schools were characteristic of the public school system (rather than the private school system); there are virtually no private separate middle grade schools (McLaughlin, O'Donnell, and Ries 1995).*
- *The prevalence of separate middle grade schools was associated with district affluence during the 3-year period studied. For example, the higher the SES of a district, the higher was the proportion of seventh graders attending separate middle grade schools.*
- *On average, over one-eighth (13 percent) of the nation's schools changed their grade structure in some way each year. For example, from the 1989-90 school year to the 1990-91 school year, 11,501 (14 percent) of the schools in regular school districts changed their grade structure. Nearly one-sixth (16 percent) of these changes were major changes (such as changing from an elementary school to a separate middle grade school).*

Detailed Description of Findings

Changes in the numbers of separate middle grade schools. Separate middle grade schools for early adolescents, as defined in this report, include schools labeled as junior high schools (i.e., schools serving grades 7-9). The number of schools typically considered to be junior high schools declined by 20 percent from 1986-87 to 1990-91 (from 2,182 to 1,601). Conversely, the number of schools considered to be the prototypic middle school (i.e., schools serving grades 6-8) increased by 23 percent (from 4,628 to 5,700) (see figure 2.2). The number of grade 5-8 and grade 6-8 schools increased from the 5,466 in 1987-88 reported by Alexander and McEwin (1989) to 6,890 in 1990-91—an increase of 26 percent. Undoubtedly, these changes, moving fifth and sixth grade classes out of elementary schools and ninth grades into high schools, permitted some high schools to remain open that would otherwise have had to merge or close as the high-school-age population declined during this period while simultaneously addressing the problem of elementary school crowding as the population size of this age group grew. Nonetheless, there is strong evidence of support for the middle school movement.

Figure 2.2— **Number of separate middle grade schools (1990-91) by grades served, and changes in their numbers since 1986-87**

Lowest Grade	Highest Grade 7	Highest Grade 8	Highest Grade 9
4	69 (-30)	280 (-8)	8 (+3)
5	102 (+2)	1,190 (+53)	16 (-4)
6	127 (+14)	5,700 (+1,072)	111 (-33)
7	41 (-23)	2,942 (-20)	1,601 (-581)
8		35 (-7)	130 (-41)
9			59 (+2)

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

Changes in the proportion of seventh graders attending separate middle grade schools for early adolescent students. The number and proportion of sixth, seventh, and eighth graders enrolled in separate middle grade schools consistently increased, and the number and proportion of ninth graders enrolled in separate middle grade schools consistently decreased from 1986-87 to 1990-91 (see table 2.1). From the 1986-87 school year to the 1990-91 school year, the proportions of sixth and seventh graders enrolled in separate middle grade schools increased from 37.4 and 81.6 percent, respectively, to 45.4 and 83.3 percent. On the other hand, the proportion of ninth graders in separate middle grade schools declined from 19.8 percent to 14.5 percent.

Table 2.1— Number of separate middle grade schools and percentages of fifth through ninth graders enrolled in these schools in regular districts: 1986-87 to 1990-91

	Number of Separate Middle Grade Schools	Percentage of 5th Graders Enrolled in Separate Middle Grade Schools	Percentage of 6th Graders Enrolled in Separate Middle Grade Schools	Percentage of 7th Graders Enrolled in Separate Middle Grade Schools	Percentage of 8th Graders Enrolled in Separate Middle Grade Schools	Percentage of 9th Graders Enrolled in Separate Middle Grade Schools
1986-87	11,967	5.8	37.4	81.6	81.0	19.8
1987-88	11,896	6.1	39.3	81.8	81.2	18.3
1988-89	11,937	6.1	41.3	82.1	81.5	16.9
1989-90	12,141	6.1	43.6	82.8	82.1	15.5
1990-91	12,411	5.9	45.4	83.3	82.7	14.5

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

Separate middle grade schools for early adolescents were more prevalent in certain types of regular school districts (see table 2.2). In the 1987-88 school year, the proportion of seventh graders enrolled in separate middle grade schools in larger regular school districts (i.e., those with district enrollments of at least 1,000 students) ranged from 80 to 90 percent. However, less than one-third (30 percent) of seventh graders in small (under 1,000 students) school districts were enrolled in separate middle grade schools. Smaller districts may simply lack sufficient students or resources to justify the creation of new schools for a relatively small proportion of their population.

Because characteristics such as size and urbanicity of school districts are correlated with each other, it is impossible to discern from simple crosstabulations which characteristics are directly related to having a separate middle grade school for early adolescents and which characteristics are merely indirectly related through their correlations with other factors. Therefore, multivariate analyses, controlling for metropolitan status, percentage of minority students (in 1987-88), and SES (as measured in the 1990 U.S. Census[11]) were conducted. These analyses hold all analytic factors constant, except for the factor being investigated, and calculate the likelihood of seventh graders being enrolled in separate middle grade schools among districts that were "average" on all of the other factors. So, the equated mean percentage for districts with an enrollment of 0-999 is an estimate of what the percentage would be for districts of this size if variation due to indirect relations, which in turn were due to other factors (e.g., average percent minority, SES, and metropolitan status), were removed. Similarly, the change in the equated mean percentage for districts of this size represents how much the likelihood of seventh graders being enrolled in separate middle grade schools changed from 1987-88 to 1990-91 if variation due to factors other size were eliminated.

The basic findings for 1987-88 reported above were unchanged—the larger the district, the greater the proportion of seventh graders in separate middle grade schools. Once again, the proportion of seventh graders in separate middle grade schools in the smallest districts was much less than half the proportion in other districts. The growth in the proportion of students enrolled in separate middle grade schools was highest in the smallest districts, whether or not controlling for other district characteristics. These districts had the greatest potential for increases, and a much larger proportion of their seventh graders were enrolled in other types of schools than in the larger districts.

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[11] The percentage of children in poverty in a school district, taken from the 1990 U.S. Census, was the best available indicator of poverty. Using this measure, each school district was categorized in the same way for each year studied.

Table 2.2— Changes in the percentages of seventh-grade students enrolled in separate middle grade schools in regular districts, by different characteristics: 1987-88 to 1990-91

	Number of 7th-Grade Students in Analysis	Percentage of 7th-Graders Enrolled in Separate Middle Grade Schools (1987-88)	Change in Percentage	Equated Mean Percentage (1987-88)	Equated Mean Change in Percentage
Overall	3,037,978	82.0	1.4	(†)	(†)
District size (1987)					
0 - 999	219,041	30.3	4.5	37.0	3.5
1,000 - 4,999	941,065	80.4	1.7	83.1	1.3
5,000 - 9,999	487,109	86.0	2.4	85.5	2.3
10,000 and over	1,390,763	89.8	0.4	87.1	0.9
Metropolitan status (1987)					
Urban/central cities	793,680	88.5	0.3	86.4	1.1
Suburban/metropolitan	1,443,383	87.1	1.0	83.7	1.1
Rural	800,915	66.3	3.2	74.6	2.3
Percent minority (1987)					
< 5%	681,717	68.4	2.5	75.1	1.5
5% - < 20%	771,105	86.6	1.3	84.9	1.2
20% - < 50%	789,869	87.9	1.4	85.5	1.6
50% and over	795,287	83.3	0.6	81.6	1.4
SES (% of school-age children in poverty: 1990)					
0% - < 5%	325,942	89.1	1.1	89.2	1.4
5% - < 15%	1,064,339	83.8	1.8	84.7	1.7
15% - < 25%	842,805	81.3	1.4	82.0	1.2
25% and over	804,892	77.5	1.1	75.4	1.2

(†) Values for *Overall* "Equated Mean Percentage (1987-88)" and "Equated Mean Change in Percentage" are omitted because they are the same as the simple means, by definition.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91; U.S. Department of Education, National Center for Education Statistics, School District Data Book Version 1.0, June 1994.

Separate middle grade schools were most prevalent in urban and suburban districts. However, even in rural districts (in 1987-88), nearly two-thirds (66 percent) of seventh graders were enrolled in separate middle grade schools. Controlling for other district characteristics reduces the differences between proportions in the urban and rural districts. (This uncontrolled difference is most likely due to the association between district size and the metropolitan status of the community served by the district. For example, rural districts tend to have relatively few pupils.) Nevertheless, even controlling for other factors, rural districts showed the greatest increases in the proportions of their seventh graders enrolled in separate middle grade schools over the 1987-88 to 1990-91 period.

Similarly, the proportion of seventh graders in separate middle grade schools in low (less than 5 percent) minority districts reflected the associations between rural status, small size, and low minority composition: The proportion of seventh graders in separate middle grade schools was lowest in the low minority districts. However, controlling for other characteristics only reduced, rather than eliminated, this relationship. On the other hand, increases in the proportion of seventh graders in separate middle grade schools were primarily found in districts with low percentages of minorities, but controlling for other characteristics, there was no systematic relation between percent minority and an increase in the likelihood of a separate middle grade school.

Separate middle grade schools for early adolescents appeared to be an innovation most strongly supported by the more affluent districts. For example, the proportion of seventh graders enrolled in separate middle grade schools was largest in districts with low percentages of students eligible for free or reduced-price lunch. Even controlling for other district characteristics, this relationship remained robust.

Changing schools into separate middle grade schools (as well as building new schools) is one of the ways in which school districts deal with changes in the age distributions of their students and with education reform concerns. Schools frequently change the grade levels of the students they serve. For example, from 1986-87 to 1990-91, about one-eighth (12 percent) of all schools in regular districts changed their grade span each year (see table 2.3).[12] Many of these grade-span changes occurred in small schools. Of the 9,672 schools that changed their grade spans from 1986-87 to 1987-88, over one-fifth (21 percent) had enrollments of less than 100.[13] Undoubtedly, some of these grade changes in the smaller schools represent cases in which schools simply enrolled no students in a grade for a given year. However, such organizational changes in larger schools are quite unlikely.

Although many of these grade-span changes were comparatively minor (such as changing from a K-6 school to a grades 1-6 school), about one-sixth of the changes were major. A major change involves a transition from being an elementary, middle, secondary, or combined school to another type of school. It should also be noted that seemingly minor changes (such as the addition or elimination of prekindergarten and kindergarten programs) are changes with significant impact on the local community.

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[12] Grade span is defined as the lowest and highest grade in which there are students enrolled in a school. It reflects the grade range of students actually served rather than the range of grades that could be offered.

[13] Of the schools that did not change their grades structure over this time period, only 7 percent had enrollments of less than 100.

Table 2.3— Numbers and percentages of schools changing their grade-span structure in regular districts: 1986-87 to 1990-91

	Number of Schools	Number of Schools Changing Grade Span	Percentage of Schools Changing Grade Span	Percentage of Schools With Major Changes in Grade Span
1986-87 to 1987-88	78,999	9,672	12.2	2.0
1987-88 to 1988-89	79,109	9,194	11.6	1.8
1988-89 to 1989-90	79,133	9,885	12.5	2.0
1989-90 to 1990-91	79,611	10,480	13.1	2.1

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

From 1987-88 to 1990-91, 2,272 schools closed. Of the 78,000 schools in existence throughout this period, about one-quarter (23 percent) had a different grade span for the 1990-91 school year than they had in 1987-88 (see table 2.4).[14] Many of the schools underwent grade-span changes more than once during this period.

Changes in grade span were more likely to occur in schools in small districts (under 1,000 students) and in high minority or low SES districts, whether or not controlling for other district characteristics. However, the differences were small. Overall, changes in grade span seem to be pervasive and are relatively independent of district characteristics. The smallest districts would be most likely to reflect changes due to having no students at a grade level in a given year.

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[14] Most of the 18,801 changes between 1987-88 and 1990-91 involved prekindergarten, kindergarten, or the separations between elementary, middle, and senior grades. Five specific changes accounted for nearly two-thirds of all changes: (1) 3,813 schools merely added prekindergarten and 1,385 schools discontinued it; and (2) 618 schools added kindergarten and 582 discontinued it. At the elementary-to-middle transition, sixth grade was changing: (3) 2,757 elementary schools dropped it as 843 separate middle grade schools added it. At the middle-to senior transition, ninth grade was changing: (4) 544 middle or junior high schools dropped it as 412 senior high schools added it. The only other change involving more than 500 schools at a level was: (5) 505 elementary/separate middle grade schools dropped both seventh and eighth grades as 174 secondary schools added those grades.

Table 2.4— Percentages of schools changing grade span in regular districts, as a function of district characteristics: 1987-88 to 1990-91

	Number of Schools	Percentage of Schools Changing Grade Span	Equated Mean Percentage of Schools Changing Grade Span
Overall	77,993	23.2	(†)
District size (1987)			
0 - 999	14,131	25.2	26.1
1,000 - 4,999	26,471	23.4	24.4
5,000 - 9,999	11,220	20.3	20.7
10,000 and over	26,171	23.1	21.8
Metropolitan status (1987)			
Urban/central cities	16,502	24.4	24.7
Suburban/metropolitan	32,628	21.9	22.7
Rural	28,863	24.0	23.2
Percent minority (1987)			
< 5%	23,163	22.5	22.0
5% - < 20%	21,646	22.3	22.8
20% - < 50%	17,398	23.8	24.4
50% and over	15,786	24.8	24.8
SES (% of school-age children in poverty: 1990)			
0% - < 5%	7,822	20.9	22.0
5% - < 15%	27,393	22.2	22.9
15% - < 25%	22,635	23.7	23.7
25% and over	20,143	24.8	23.9

(†) The value for *Overall* "Equated Mean Percentage of Schools Changing Grade Span" is omitted because it is the same as the simple mean, by definition.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91; U.S. Department of Education, National Center for Education Statistics, School District Data Book Version 1.0, June 1994.

Program Specialization

The CCD classifies schools as regular, special education, vocational education, or alternative education. These classifications are discussed below.

School Classifications

Special education. In the past decade, the number of students with Individualized Education Plans (IEPs) has greatly increased. IEPs are prepared and mandated for students who are identified as having special needs that cannot be fulfilled through regular education programs. Special needs students include children with a range of disabilities including learning disabilities, physical disabilities, and emotional disturbances. Since 1980, the number of high school students with IEPs has more than doubled (Levine and Stevenson 1994). One way to meet this increased demand for special education services would be through the establishment of more special education schools. However, the Individuals with Disabilities Education Act (IDEA, P.L. 101-476) mandates that students eligible for special education services be educated in the least restrictive environment. Underlying this law is the "mainstreaming" reform movement. Mainstreaming refers to removing exceptional children from separate classes and institutions and placing them in "the mainstream"—that is, in regular classes and schools (Kaufman, Agard, and Semel 1986). Interpretations of "least restrictive environment" have been inconsistent and have been challenged in several different courts. The impact of this law and practices employed in its implementation were examined through CCD data dealing with the number of students with IEPs, the number of students enrolled in special education schools, and the number of special education schools.[15]

Vocational education. Vocational education, by definition, is concerned with preparing students for employment after high school graduation. With the shift towards a service-based economy and projected growth in technological areas, the generic skills that must be taught to enable high school graduates to succeed in the work force today are believed to be quite different from those required in the past. The generic skill requirements of the nation's economy are changing. Reading, quantitative, and computer skills appear to be important. However, in the absence of agreement as to what these generic skill requirements are, it is difficult for educators to develop programs to teach these skills (Berryman 1993). Similarly, the need for higher-order thinking skills is important, as are interpersonal skills. The Secretary's Commission on Achieving Necessary Skills (SCANS) (1991) describes these abilities as working in teams, teaching others new skills, serving customers, showing leadership, negotiating, and working with diversity.

For these reasons, the practice of teaching specific employment skills has been questioned. In the rapidly changing work place, the utility of a specific skill may be negligible, particularly when generic skills are so highly valued. Accordingly, the value of specialized vocational schools has been questioned. Additionally, with increased accountability pressures (that is, evaluating districts on the proportion of graduates going to college), some districts are discouraging vocational education options. Further contributing to the decline of vocational education schools is competition within the public school system: Vocational programs are not the sole domain of vocational schools. In the 1991-92 school year, there were 435 magnet programs with vocational themes (Steel and Levine 1994), as well as many vocational course offerings at regular schools.[16] Since no CCD category for magnet schools exists, their classification can be quite arbitrary. Given the stigma associated with vocational high schools, it seems reasonable to assume that many vocationally oriented magnet schools chose to classify themselves as "regular" rather than "vocational" schools.

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[15] Nonregular school districts (e.g., regional education service agencies, state-operated institutions, and supervisory union administrative centers) include institutions that serve special education students. These kinds of districts, which serve proportionally more students with IEPs than regular school districts, were excluded from the tables and analyses discussed in this report. However, the net effect of their exclusion is slight. In 1987-88, 1.0 percent of the nation's students with IEPs were being served in nonregular districts; in 1988-89, 1.7 percent; in 1989-90, 2.2 percent; and in 1990-91, 1.9 percent.

[16] According to the 1990-91 Schools and Staffing Survey, 63.8 percent of schools serving 12th graders offered vocational education in 1990-91 (Choy et al. 1993).

Alternative education. By holding schools and districts accountable for dropout rates, pressures for developing and expanding alternative programs and schools are created with the expectation that these strategies will increase student retention and reduce dropout rates. These programs and schools, by engaging and educating students at risk of dropping out, would improve both the performance of the district (with respect to this publicly reported measure) and the chances for success of at-risk students. As with special education programs and vocational programs, alternative education programs can be offered at regular schools, as well as those devoted exclusively to alternative education.

It appears that there are strong pressures for specialized program offerings to meet the needs of specific student populations. These services can be delivered in many ways, including both schools designed to serve only these special populations and the offering of special programs at regular high schools. CCD data provide information on the extent to which school specialization has been employed to deliver these special services, as well as the numbers of students with IEPs.

Summary of Findings

- *The vast majority of students attending schools in regular school districts attended "regular" schools. Only about 1 percent of students in these districts attended schools labeled as "special education," "vocational education," or "alternative education."*
- *The number of special education students (that is, students with IEPs) has increased by 1,387,622 (56 percent) from 1987-88 to 1990-91. By 1990-91, nearly 10 percent of the students in regular school districts had IEPs.*
- *The vast majority of special education students attend regular schools. Of the nearly four million students with IEPs enrolled in regular school districts in 1990-91, only 165,165 were enrolled in special education schools.*
- *The number of students enrolled in special education schools increased by only 12,591 (8 percent) over this period.*

Detailed Description of Findings

Changes in the prevalence of regular and other types of schools. The number of regular schools and other types of schools has remained relatively constant from 1987-88 to 1990-91. In regular school districts (which serve approximately 98.8 percent of the nation's public school students), 99 percent of the students attended regular schools. Only about 1 percent of the students attended special education, vocational education, or alternative education schools (see table 2.5).

Table 2.5— Percentages of different types of schools and students enrolled in those schools in regular districts: 1987-88 to 1990-91

	Number of		% Regular		% Special Ed.		% Vocational Ed.		% Alternative Ed.	
	Schools	Students	Schools	Students	Schools	Students	Schools	Students	Schools	Students
1987-88	81,834	39,678,096	96.3	99.1	1.7	0.4	0.9	0.3	1.1	0.3
1988-89	81,644	39,860,389	96.6	99.1	1.6	0.4	0.9	0.3	1.0	0.2
1989-90	82,246	40,222,819	96.1	98.9	1.7	0.4	0.9	0.3	1.3	0.4
1990-91	83,341	40,840,902	96.0	99.0	1.9	0.4	0.8	0.3	1.3	0.3

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

From 1987-88 to 1990-91, the percentages of vocational education schools declined slightly, and the percentages of special education and alternative education schools slightly increased. The proportions of students served by these schools remained relatively constant.

From 1987-88 to 1990-91, the number of students with IEPs in regular school districts increased by 1,387,622 (about 56 percent).[17] However, during this time period, the number of students enrolled in special education schools remained relatively constant, increasing by only 12,591 (about 8 percent)[18]—still somewhat larger than the overall 3 percent increase in the total student population. It appears that most of the newly labeled special education students were being mainstreamed, but the increase in students not being mainstreamed was greater than the general increase in the student population. These data do not indicate whether the "least restrictive environment" goals of IDEA were being met.[19]

From 1987-88 through 1990-91, the smallest districts (less than 1,000 students) showed the greatest increase in their proportions of students with IEPs (controlling for other district characteristics) (see table 2.6). Their equated mean change (controlling for factors other than district enrollment size) indicates that a hypothetical small district with average SES, minority composition, and urbanicity would have had an increase of 3.8 percent in the proportion of their students who had IEPs (rather than the "actual" 3.3 percent mean change). This represented a 61 percent increase in the proportion of their students with IEPs (from an equated mean of 6.2 percent to 6.2 + 3.8 = 10.0 percent). The equated proportional increase was even greater in districts serving between 1,000 and 4,999 students: 63 percent (from an equated mean of 5.4

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[17] U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

[18] *Ibid.* This increase is only an increase of 0.03 percent of the total student population. Due to rounding percentages to the nearest tenth, tables do not always reflect changes this small.

[19] If one assumes that the incidence of students for whom the least restrictive environment is a special school remains constant, this modest increase is still not proof of failure to comply with the mandated goals. Increased retention of special education students in these programs may account for some of this increase. Conversely, the assumption of constancy of the incidence of students for whom the least restrictive environment is a special school may be false. Improved medical care may be responsible for an increased survival rate of children who could not be educated in regular classrooms.

percent to 8.8 percent). The proportional increase was lowest, but still substantial, in districts with 10,000 or more students: 39 percent (from an equated mean of 7.1 percent to 9.9 percent).

The proportion of students with IEPs was greatest in rural districts. Controlling for other district characteristics, the difference between the proportion of IEP students in rural districts and their proportional representation in other districts increased further. The proportion of students with IEPs in rural districts also increased substantially from 1987-88 to 1990-91. The increases in rural districts were as great or greater than in urban or suburban districts.

Increases in the proportions of students with IEPs were also characteristic of districts with the highest minority concentrations. The proportion of students with IEPs in predominantly minority districts increased by 66 percent from 1987-88 to 1990-91 (from 5.6 percent to 9.3 percent). Controlling for other district characteristics, including SES and size, the proportion of students with IEPs in predominantly minority districts nearly doubled (from 5.2 percent to 10.0 percent). However, predominantly minority districts had the lowest proportions of students with IEPs in 1987-88; their larger increases may represent a "catching up" process.

No obvious relationships were noted between a district's SES and either the proportion of students with IEPs or changes in these proportions over the period investigated.

Table 2.6— Changes in percentages of students with IEPs in regular districts with different characteristics: 1987-88 to 1990-91

	Number of Students	Percentage with IEPs (1987-88)	Equated Mean Change	Equated Mean Percentage (1987-88)	Mean Change
Overall	39,445,314	6.3	3.1	(†)	(†)
District enrollment (1987)					
0 - 999	2,868,849	6.9	3.3	6.2	3.8
1,000 - 4,999	12,338,439	5.7	2.9	5.4	3.4
5,000 - 9,999	6,493,970	6.1	3.3	5.9	3.4
10,000 and over	17,744,056	6.6	3.2	7.1	2.8
Metropolitan status (1987)					
Urban/central cities	10,819,922	6.2	3.5	5.8	3.6
Suburban/metropolitan	18,457,704	6.1	2.9	6.1	2.9
Rural	10,167,688	6.8	3.3	7.1	3.6
Percent minority (1987)					
< 5%	8,968,194	6.1	2.2	6.5	1.9
5% - < 20%	10,550,822	6.2	3.1	6.4	3.0
20% - < 50%	9,836,200	7.2	3.5	7.0	3.7
50% and over	10,090,098	5.6	3.7	5.2	4.8
SES (% of school-age children in poverty: 1990)					
0% - < 5%	4,209,191	5.9	1.9	6.1	3.1
5% - < 15%	13,566,150	6.1	3.5	6.0	4.4
15% - < 25%	10,866,475	6.7	3.4	6.4	3.7
25% and over	10,803,498	6.2	2.9	6.5	2.2

(†) Values for *Overall* "Equated Mean Percentage (1987-88)" and "Mean Change" are omitted because they are the same as the simple means, by definition.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91; U.S. Department of Education, National Center for Education Statistics, School District Data Book Version 1.0, June 1994.

Questions for Further Research

In response to both shifting demographics and to education reform concerns, there have been impressive increases in the proportion of sixth, seventh, and eighth graders enrolled in separate middle grade schools.[20] By 1990-91, close to half (45 percent) of the nation's sixth graders and about five-sixths (83 percent) of the nation's seventh and eighth graders were enrolled in these types of schools. The relationship between these types of schools and performance cannot be addressed through CCD data, leading one to wonder:

> *How does the education performance of sixth, seventh, and eighth graders enrolled in separate middle grade schools compare to the performance of similar students enrolled in schools with different grade structures?*
>
> *What social impacts, if any, are associated with attending this type of school?*

Very few students (about 1 percent) attend special education, vocational education, or alternative education schools. However, many "regular" schools are becoming specialized and are offering distinctive curricula and education approaches. In the 1991-92 school year, there were 2,433 magnet schools and at least 2,217 other specialty schools (Steel and Levine 1994), representing nearly 7 percent of the nation's public schools. Although some of these magnet and specialty schools might be considered to be "vocational education" or "alternative" schools, most are labeled as "regular" schools. These data suggest that the following questions be addressed:

> *How many schools in the nation offer distinctive curricula or instructional approaches?*
>
> *What specific types of specialized programs are being offered?*
>
> *Where are these specialized programs most likely to be offered?*
>
> *How has the number and distribution of these special programs changed over time?*

The number of special education students increased dramatically (by 56 percent) from 1987-88 to 1990-91. The increase, as well as the overall proportion of students with IEPs (i.e., special education students) is associated with certain district characteristics. States and districts vary tremendously with respect to the proportion of their students who have IEPs. These changes suggest the following questions:

> ***Are there any relationships between a school's (or a district's) racial-ethnic composition and the proportion of its students who have IEPs?***
>
> *What factors are associated with the proportion of students who have IEPs?*

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[20] The term "separate middle grade schools," as used in this report, refers to schools whose enrollment is primarily or exclusively composed of early adolescent children.

Will the increase in the proportion of students who have IEPs continue in the future?

If so, will there be an adequate supply of trained special education professionals to serve the needs of this population?

Finally, there is the overarching question:

What relationships exist between school specialization and education quality?

3 How Has the Racial-Ethnic Composition of the Population Served by Schools Changed?

Overview

Recent projections suggest that by the year 2035, white non-Hispanic individuals will no longer comprise the majority of the nation's school-age population (Population Research Bureau 1993). Well before this time, Hispanics are expected to become the nation's largest minority group. These projections imply an increasing demand for bilingual or limited English proficient (LEP) education. Additionally, with major demographic shifts, once-balanced neighborhood schools can become racially imbalanced with respect to their district's overall racial-ethnic composition, and districts' once-balanced racial-ethnic composition can become imbalanced with respect to their state's racial-ethnic composition.

This chapter will review trends (from 1987-88 to 1990-91) in the racial-ethnic composition of the nation's public school system. The following chapter (chapter 4) will discuss issues of racial-ethnic balance and racial-ethnic exposure. These reviews are based on race-ethnicity data provided to NCES by the National Cooperative Education Statistics System (NCESS) State Coordinator. These data are requested, but not always provided, for each public school in each state. Responsiveness to requests for these data has improved substantially since 1987-88 (when racial breakdowns were provided for 62.9 percent of the schools) to 1990-91 (when these data were provided for 89.0 percent of the schools).[21] In order to conduct the analyses reported, missing data were imputed using procedures discussed in Appendix B.

Racial-Ethnic Composition Trends

CCD data were used to determine demographic trends and to identify the types of schools and districts undergoing the greatest changes in their racial-ethnic composition from 1987-88 to 1990-91.

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[21] Missing data were not distributed randomly. They were associated with particular states. For example, in 1987-88, data were not provided for 30,345 schools. In 20 states, data were missing for most schools, accounting for 96.5 percent of 1987-88's missing data. In the 1990-91 CCD, 94.1 percent of the 9,208 schools for which data were missing were concentrated in only 10 states. The distribution of missing data, by state and year, is summarized in Appendix B.

Only 5 percent of the schools (4,265 out of 84,778) in existence from 1987-88 to 1990-91 were missing racial-ethnic CCD breakdowns in all 4 years. These schools were located in 1,507 (out of 15,183) districts, and over half (56 percent) were in three states.

Summary of Findings

- *The number of students in public elementary and secondary schools in regular school districts in the United States increased by approximately one million from 1987-88 to 1990-91. Over this same period, the number of Hispanic students increased by about 645,000 and the number of Asian students by about 140,000.*

- *The proportion of minority public school students in regular school districts steadily increased from 1987-88 through 1990-91. However, the proportion of black non-Hispanic students declined.*

- *The proportion of public school students who were Hispanic showed steady and consistent increases over this time period. The proportion of Asian students also increased, though by a smaller amount.*

- *The proportion of white non-Hispanic students is highest in the most affluent districts and declines with decreasing affluence. (Affluence refers to the percentage of school-age children in poverty in the district). Conversely, the proportion of Hispanic and black non-Hispanic students is lowest in the most affluent districts and increases with decreasing affluence.*

- *Most of the nation's minority students were served by school districts with enrollments of 10,000 students or more. Although these districts served less than half (46 percent) of the nation's students, they served over two-thirds (69 percent) of the nation's black and Hispanic students and over 70 percent of the nation's Asian students.*

- *In 1988-89, the proportion of students in large cities who were of Hispanic origin exceeded the proportion of students who were white by 0.3 percent; by 1990-91, this difference had increased to 3.2 percent. In large city schools in 1990-91, white students comprised about one-quarter (26 percent) of the student enrollment. Black students comprised 38 percent of the enrollment; Hispanics, 29 percent.*

- *Each year from 1987-88 to 1990-91, the concentrations of black students in special education schools, vocational education schools, and alternative education schools were greater than in regular schools; the concentrations of white non-Hispanic and Asian students were lower in these special schools. When other school characteristics (including type of community) were controlled for, these effects were reduced but not eliminated.*

Detailed Description of Findings

General trends in racial-ethnic composition of public schools. As shown in table 3.1, the proportion of white non-Hispanic students in public schools in regular districts continued to decline from 1987-88 to 1990-91. This decline was due to changes in the racial-ethnic composition of the population, particularly with respect to the demographics of school-aged children (Census 1980; Census 1990).[22]

Table 3.1— Racial-ethnic composition (percentages) of public schools in regular districts: 1987-88 to 1990-91

	Number of Students	% Native American	% Asian	% Hispanic	% Black	% White
1987-88	39,963,281	1.0	3.0	10.2	16.5	69.3
1988-89	40,120,672	1.0	3.1	10.7	16.4	68.8
1989-90	40,408,326	1.0	3.2	11.2	16.3	68.4
1990-91	40,911,261	1.0	3.3	11.6	16.2	67.9

NOTE: Percentages may not add to 100 percent due to rounding error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

As table 3.2 indicates, the total number of public school students increased by nearly 950,000 over this time period. The numbers of students in all of the five racial-ethnic categories increased. The number of Hispanic students increased the most: by about 645,000. As a result of these changes, the proportional representation of Hispanics in the public schools increased by 1.4 percent (table 3.1). The number of Asian students increased by about 140,000, increasing their proportional representation by 0.3 percent. Even though the number of black non-Hispanic students increased by about 25,000 and white non-Hispanic students by about 100,000, their proportional representations decreased by 0.3 percent and 1.4 percent, respectively.

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[22] The alternative explanation, that white students were leaving the public schools in favor of private schools, is not supported by the data. From 1987-88 to 1990-91, the percentage of students enrolled in private schools who were white declined from 81 percent to 78 percent. This was less than the decline in the proportion of white students in public schools. During this same period, the number of students enrolled in private schools declined by 544,765 (from 5,218,643 to 4,673,878, or 10.4 percent) (McLaughlin, O'Donnell, and Ries 1995).

Table 3.2— Racial-ethnic composition of public schools in regular districts: 1987-88 to 1990-91

	Number of Students	Native American	Asian	Hispanic	Black	White
1987-88	39,963,281	380,447	1,211,852	4,091,079	6,600,665	27,679,238
1988-89	40,120,672	387,705	1,249,011	4,273,764	6,591,746	27,618,446
1989-90	40,408,326	394,031	1,298,846	4,512,380	6,581,510	27,621,559
1990-91	40,911,261	406,339	1,352,140	4,736,148	6,627,997	27,788,637

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

SES (poverty rates). Consistent with most people's expectations, poverty rates (i.e., the percentage of children in poverty, according to the 1990 Census definition) were highest in urban metropolitan status districts and lowest in suburban districts. Accordingly, nearly three-fifths (59 percent) of urban students were being educated in high poverty districts (i.e., those with at least 25 percent of the children in poverty), while only 6 percent of suburban students were in high poverty districts.[23]

SES, as measured by these poverty rates, was also strongly associated with a district's racial-ethnic composition. The more affluent the district, the higher the proportion of white students and the lower the proportions of black and Hispanic students (see table 3.3). The proportional increase of Asian students from 1987-88 to 1990-91 was highest in the most affluent districts.

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[23] U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1990-91; U.S. Department of Education, National Center for Education Statistics, School District Data Book Version 1.0, June 1994.

Table 3.3— Racial-ethnic composition of regular districts, by SES (percentage of population in poverty): 1987-88 to 1990-91[a]

	Number of Students in Analysis	% Native American	% Asian	% Hispanic	% Black	% White
Overall						
1987-88	39,963,281	1.0	3.0	10.2	16.5	69.3
1988-89	40,120,672	1.0	3.1	10.7	16.4	68.8
1989-90	40,408,326	1.0	3.2	11.2	16.3	68.4
1990-91	40,911,261	1.0	3.3	11.6	16.2	67.9
Percentage of school-age children in poverty: 1990						
< 5%						
1987-88	4,243,231	0.3	3.6	4.2	3.7	88.2
1988-89	4,300,465	0.3	3.8	4.4	3.8	87.8
1989-90	4,349,079	0.3	4.0	4.7	3.9	87.1
1990-91	4,427,781	0.3	4.2	4.9	3.8	86.8
5% - < 15%						
1987-88	13,645,900	0.7	2.6	5.4	7.4	83.9
1988-89	13,797,186	0.7	2.7	5.7	7.5	83.4
1989-90	13,998,850	0.7	2.8	6.1	7.5	82.8
1990-91	14,269,556	0.7	3.0	6.5	7.6	82.2
15% - <25%						
1987-88	10,932,638	1.0	3.5	8.8	14.2	72.4
1988-89	11,025,089	1.0	3.6	9.4	14.4	71.7
1989-90	11,144,517	1.0	3.6	10.0	14.3	71.1
1990-91	11,322,823	1.0	3.7	10.5	14.4	70.4
25% and over						
1987-88	10,984,196	1.5	2.9	20.0	35.2	40.4
1988-89	10,954,566	1.5	2.9	20.6	34.7	40.2
1989-90	10,915,880	1.6	3.0	21.5	34.5	39.5
1990-91	10,878,202	1.6	3.0	22.1	34.4	38.9

[a] Only districts for which SES data were available are included in these analyses.

NOTE: Percentages may not add to 100 percent due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91; U.S. Department of Education, National Center for Education Statistics, School District Data Book Version 1.0, June 1994.

School locale. The CCD classifies the locale of a school relative to populous areas according to a hierarchy of seven locale codes as shown in table 3.4.[24] (The definitions of each of these locale codes is provided in Appendix A—Definitions of Key Terms.)

From 1987-88 to 1990-91, there was a very strong relationship between a school's "urbanicity" and its proportion of minority students (specifically, black, Hispanic, and Asian students) (see table 3.4). In schools in large cities, three-quarters of the public school population were minorities; in contrast, in schools in rural locales, only 15 percent of the students were minorities.

Minority group members were not equally distributed among the different school locales. Blacks and Hispanics were most concentrated in large city schools. Blacks were next most concentrated in mid-size cities. The concentrations of Hispanics were at comparable levels in mid-size city schools and in schools on the urban fringe of large cities. Native Americans, in contrast, were more frequently enrolled in rural and small town schools.

Growth in the proportions of Hispanic students occurred in all different school locale categories, from rural locales to large city schools. In large city schools, the proportion of Hispanic students exceeded the proportion of white students in 1988-89. By 1990-91, the proportion of Hispanic students in these districts exceeded that of white students by 3.2 percent. The proportion of black students and white students in large city schools decreased from 1987-88 to 1990-91 by 1.3 percent and 1.4 percent, respectively. Even though the proportion of blacks declined in large city schools, they remained greater than the proportions of white and Hispanic students.

Growth in the proportion of Asian students occurred in all of the seven different types of locales from 1987-88 to 1990-91. However, Asian students were most concentrated in the schools in large cities and their urban fringes and underrepresented in rural and large- and small-town schools.

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[24] State-level CCD Coordinators are asked to verify these local codes, which are determined by the school's mailing address. For the 1990-91 CCD, there were massive changes in locale classifications: 7.1 percent of the schools had their locale codes "corrected" by the CCD Coordinators. (For the 1988-89 CCD, changes were made for only 0.4 percent of the schools; for 1989-90, 1.6 percent.) These changes were also clustered in a few states. The large number of changes made in 1990-91 make the school locale data noncomparable with previous years. So, for 1990-91 data, the previous year's locale codes were employed to preserve the validity of the longitudinal comparisons in this report.

Table 3.4— Racial-ethnic composition of schools, by locale: 1987-88 to 1990-91

	Number of Students	% Native American	% Asian	% Hispanic	% Black	% White
Overall						
1987-88	39,963,281	1.0	3.0	10.2	16.5	69.3
1988-89	40,120,672	1.0	3.1	10.7	16.4	68.8
1989-90	40,408,326	1.0	3.2	11.2	16.3	68.4
1990-91	40,911,261	1.0	3.3	11.6	16.2	67.9
Locale						
Large city						
1987-88	5,466,019	0.4	5.9	26.6	39.6	27.4
1988-89	5,456,282	0.4	5.9	27.4	39.1	27.1
1989-90	5,463,047	0.5	6.0	28.5	38.4	26.6
1990-91	5,450,369	0.4	6.1	29.2	38.3	26.0
Mid-size city						
1987-88	6,745,709	0.7	0.3	11.2	20.6	64.2
1988-89	6,790,885	0.7	3.4	11.7	20.4	63.7
1989-90	6,774,293	0.7	3.5	12.5	20.5	62.8
1990-91	6,896,263	0.7	3.6	13.1	20.5	62.1
Urban fringe of large city						
1987-88	6,709,547	0.4	5.2	11.0	12.4	71.1
1988-89	6,772,783	0.4	5.4	11.5	12.5	70.3
1989-90	7,034,880	0.4	5.6	11.9	12.5	69.5
1990-91	7,170,467	0.4	5.8	12.5	12.6	68.7
Urban fringe of mid-size city						
1987-88	4,783,416	0.4	3.3	6.0	12.7	77.5
1988-89	4,815,378	0.4	3.4	6.3	12.8	77.1
1989-90	4,803,029	0.4	3.5	6.9	13.0	76.1
1990-91	4,899,979	0.5	3.7	7.3	13.1	75.4
Large town						
1987-88	975,586	1.0	1.8	6.7	12.2	78.3
1988-89	963,478	1.0	1.9	7.0	12.5	77.5
1989-90	948,809	1.1	1.9	7.5	12.4	77.0
1990-91	954,659	1.1	2.0	7.9	12.4	76.6
Small town						
1987-88	8,750,048	1.4	0.9	6.6	10.3	80.7
1988-89	8,762,781	1.4	1.0	6.9	10.2	80.5
1989-90	8,745,183	1.4	1.0	7.2	10.1	80.3
1990-91	8,854,775	1.5	1.0	7.5	10.0	80.0
Rural						
1987-88	6,532,956	2.0	0.9	3.3	8.9	84.9
1988-89	6,559,085	2.0	0.9	3.5	9.1	84.4
1989-90	6,639,085	2.0	1.0	3.6	8.8	84.6
1990-91	6,684,749	2.1	1.0	3.7	8.7	84.5

NOTE: 1990-91 rows use 1989-90 locale classifications. Percentages may not add to 100 percent due to rounding error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

About half (50.2 percent) of the nation's public schools (in the 1990-91 school year) were located in small towns or in rural areas. (See Appendix B.) Although smaller on average than schools in other types of districts, these schools still served over one-third (35.4 percent) of the population. Small town and rural schools served populations of students that were predominantly white: 80.0 percent of the small-town students and 84.5 percent of rural students were white in 1990-91. Overall, more than two-thirds (67.9 percent) of the public school population was white (see table 3.4).

District size. Since large school districts tended to be in large cities and urban areas, the relationships between level of urbanicity and racial-ethnic composition were very similar to relationships between district size and racial-ethnic composition. These large school districts are of particular interest because they are responsible for the education of a substantial portion of the nation's youth. The 100 largest public school districts—fewer than 1 percent of the nation's regular school districts—served nearly one-quarter (23 percent) of the nation's public school students in 1990-91 (Sietsema 1993); and regular school districts serving 10,000 or more students, although representing only 4 percent of all districts, served nearly half (46 percent) of the nation's public school population (see table 3.5).

Although less than half of the public school population is educated in these large districts, a substantial proportion of the nation's minority students are located in these districts. Over two-thirds (69 percent) of the black students and over two-thirds (also 69 percent) of the Hispanic students in regular school districts in 1990-91 attended schools in the largest school districts. Hispanics and blacks were not the only minorities concentrated in large districts; over 70 percent of the nation's Asian students were enrolled in districts with more than 10,000 students.[25]

From 1987-88 to 1990-91, the proportion of students who were Hispanic increased the most in the largest school districts. Since most of the enrollment growth was concentrated in these large districts, the number of Hispanic students they served increased substantially. Although the number of black students in these large districts also increased (by about 80,000) over this period, their proportional representation in the large districts actually declined by 1 percent, from 25 percent to 24 percent.[26]

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[25] In 1990-91, the largest 679 school districts (those with enrollments of at least 10,000) served 68.8 percent of the nation's black students (4,559,889 of 6,627,997); 68.7 percent of the nation's Hispanic students (3,257,802 of 4,736,148); and 70.1 percent of the nation's Asian students (948,405 of 1,352,140). SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys, 1986-87 to 1990-91.

[26] From 1987-88 to 1990-91, the number of Hispanic students in the 679 largest school districts increased by 504,321 (from 2,753,481 to 3,257,802), and the number of black students increased by 75,890 (from 4,483,999 to 4,559,889). SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys, 1986-87 to 1990-91.

Table 3.5— Racial-ethnic composition of regular districts, by district size: 1987-88 to 1990-91

	Number of Students	% Native American	% Asian	% Hispanic	% Black	% White
Overall						
1987-88	39,963,281	1.0	3.0	10.2	16.5	69.3
1988-89	40,120,672	1.0	3.1	10.7	16.4	68.8
1989-90	40,408,326	1.0	3.2	11.2	16.3	68.4
1990-91	40,911,261	1.0	3.3	11.6	16.2	67.9
Size						
0 - 999						
1987-88	2,975,916	2.9	0.9	5.4	3.7	87.2
1988-89	2,974,605	2.9	0.8	5.4	3.8	87.0
1989-90	2,927,104	2.9	0.8	5.5	3.5	87.3
1990-91	2,917,080	3.0	0.8	5.5	3.3	87.5
1,000 - 4,999						
1987-88	12,539,341	1.1	1.4	5.2	9.3	82.9
1988-89	12,513,543	1.1	1.5	5.5	9.4	82.6
1989-90	12,544,546	1.1	1.5	5.7	9.3	82.4
1990-91	12,523,715	1.1	1.5	5.8	9.1	82.4
5,000 - 9,999						
1987-88	6,533,712	0.7	2.6	7.9	12.8	75.9
1988-89	6,433,060	0.7	2.7	8.2	12.9	75.6
1989-90	6,422,276	0.7	2.8	8.8	12.7	75.0
1990-91	6,477,862	0.8	3.0	9.2	12.8	74.3
10,000 and over						
1987-88	17,914,312	0.6	4.7	15.4	25.0	54.3
1988-89	18,199,464	0.6	4.8	16.0	24.6	54.0
1989-90	18,514,400	0.7	4.9	16.6	24.3	53.5
1990-91	18,992,604	0.7	5.0	17.2	24.0	53.2

NOTE: Percentages may not add to 100 percent due to rounding error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

Type of school. Regular school districts provide services for students with special needs or interests at schools operated specifically and uniquely for such purposes as well as at regular schools. In the case of special education, the vast majority of special education students attend regular schools. Nonetheless, in 1990-91, at least 165,165 of the more than four million special education students were enrolled in special-education-only schools in regular districts (see table 3.6).

Table 3.6— Racial-ethnic composition of schools in regular districts, by type: 1987-88 to 1990-91

	Number of Students in Analysis	% Native American	% Asian	% Hispanic	% Black	% White
Overall						
1987-88	39,963,281	1.0	3.0	10.2	16.5	69.3
1988-89	40,120,672	1.0	3.1	10.7	16.4	68.8
1989-90	40,408,326	1.0	3.2	11.2	16.3	68.4
1990-91	40,911,261	1.0	3.3	11.6	16.2	67.9
Type						
Regular school						
1987-88	39,580,239	1.0	3.0	10.2	16.4	69.4
1988-89	39,764,178	1.0	3.1	10.6	16.3	69.0
1989-90	39,973,930	1.0	3.2	11.1	16.1	68.5
1990-91	40,516,673	1.0	3.3	11.6	16.1	68.1
Special education school						
1987-88	155,987	0.5	2.7	17.2	28.1	51.5
1988-89	158,960	0.7	2.7	17.2	27.5	51.9
1989-90	153,918	0.8	2.6	17.3	27.4	51.9
1990-91	165,165	0.8	2.6	16.7	28.9	50.9
Vocational education school						
1987-88	128,341	0.3	1.8	14.7	40.0	43.2
1988-89	123,620	0.4	1.6	13.2	32.3	52.5
1989-90	138,654	0.5	2.4	13.6	37.7	45.7
1990-91	114,779	0.6	2.1	14.9	33.7	48.8
Alternative education school						
1987-88	98,714	2.3	2.7	9.2	21.9	63.8
1988-89	73,914	2.8	1.8	9.1	18.3	67.9
1989-90	141,824	1.9	2.6	11.5	25.2	58.7
1990-91	114,644	2.3	2.0	9.2	24.4	62.0

NOTE: Percentages may not add to 100 percent due to rounding error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

While the number of special education students increased by about 50 percent (see chapter 2) from 1987-88 to 1990-91, the numbers of students enrolled in special education schools remained relatively constant during this period. However, the number of students enrolled in vocational and alternative education schools fluctuated considerably. The year-to-year variability in the numbers of students enrolled in alternative and vocational education schools reflects the frequent practice of reclassifying a school from year to year as its education focus changes.[27]

For each year shown in table 3.6, the proportion of black non-Hispanic students in special schools was higher than their proportional representation in regular schools; the proportional representation of Asians and of white non-Hispanics was lower for each year. For example, the proportion of students enrolled in vocational education schools in 1990-91 who were black was more than twice the proportion of students in regular schools who were black. Similarly, the proportion of students enrolled in vocational schools who were Hispanic (14.9 percent) was higher than the proportion of students in regular schools who were Hispanic (11.6 percent). However, these schools tended to be located in districts with higher proportions of minority students. As will be shown later, when other school characteristics are controlled for, many of these differences were erased or reversed.

As previously noted, large school districts tend to be in large cities and urban areas. When there are interrelationships between district characteristics (size, locale, racial-ethnic composition, and SES), it is useful to know the relationship between only size (or only locale, or only SES) and the district's racial-ethnic composition. Apparent relationships between district size and racial-ethnic composition may really be due to other factors.

In order to determine the relative importance of specific district and school characteristics both as direct and indirect factors, multivariate analyses (general linear models) were performed. This approach displays variation of an outcome (e.g., change in the proportion of the district's population that is white non-Hispanic) related to a factor of interest, holding other factors (e.g., district size, SES) constant. By controlling for other characteristics, it is possible to assess the direct association of the characteristic of interest with the racial-ethnic composition of the district or school.

The following tables present both simple mean percentages and "equated means" and "equated mean changes" for percentage of minority students. "Equated mean percent minority" shows what the racial-ethnic composition of a district with a particular attribute (e.g., enrollment of 1,000-4,999) would be if the effects of all of the other variables were ignored. "Equated mean change" shows what the average change in racial-ethnic composition (percentage of minorities) from 1987-88 to 1990-91 would be in a district of this size if the effects of all of the other variables were ignored (see table 3.7).

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[27] Of the 866 schools classified as alternative education schools in 1987-88, only 521 (60 percent) were classified as alternative education schools in each of the next 3 years; 158 (18 percent) closed down; and the remainder (187, or 22 percent) changed their status at least once or disappeared for at least one year before reappearing as an alternative education school in 1990-91.

Of the 742 schools classified as vocational schools in 1987-88, 554 (75 percent) were vocational education schools for all 4 years; 114 (15 percent) closed down; and the remainder (74, or 10 percent) changed their status at least once or disappeared for at least one year before reappearing as a vocational school in 1990-91. SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

District characteristics. Out of all of the district characteristics investigated, the one with the strongest relationship to minority composition was SES. There was a substantial disparity (47.8 percent) between the minority proportion of the richest (11.8 percent minority) and poorest districts (59.6 percent). When factors other than SES were controlled for, this disparity remained nearly unchanged (46.0 percent), and the minority composition of the richest districts and poorest districts changed only slightly (from 11.8 percent to 12.3 percent and from 59.6 percent to 58.3 percent, respectively).

District size was also related to minority composition. When controlling for factors other than district size, differences in the minority composition of districts diminished in 1987-88. However, the same relationship between district size and minority composition was maintained. Minority composition was greater in larger districts (see table 3.7). Although the difference in minority composition between the largest and smallest districts was substantially smaller when other factors were controlled, an unadjusted 32.8 percent difference (45.7 percent - 12.9 percent) in contrast to only 18.9 percent (38.5 percent - 19.6 percent), these differences were still of considerable magnitude. This suggests that district size, by itself, was strongly associated with racial-ethnic composition. Although the percentage of minorities diverged over the 3-year period (the large districts, with the most minorities, had the largest increases in the percentages of minorities, while small districts, with fewest minorities, did not have increases in their minority percentages), the equated means indicated less of an effect when other factors were controlled. Some of the apparent difference by size was actually related to other factors, such as SES.

During this time period, locale was also strongly related to minority composition. The proportion of minority students in urban/central cities was more than double the proportion of minority students in other types of districts. When other factors were controlled, the difference in minority composition between urban and rural districts was reduced from 36.6 percent (56.5 percent - 19.9 percent) to 18.8 percent (39.8 percent - 21.0 percent). The adjusted proportion of minority students in urban/central cities is still much larger (nearly double) than the adjusted proportion in rural districts. Locale is also a factor that is strongly associated with racial-ethnic composition.

Table 3.7— Changes in the percentages of minority students in regular districts with different characteristics: 1987-88 to 1990-91

	Number of Students in Analysis (1987-88)	% Minority (1987-88)	Mean Change	Equated Mean % Minority (1987-88)	Equated Mean Change
Overall	39,749,074	30.8	1.5	(†)	(†)
Size (1987)					
0 - 999	2,914,225	12.9	-0.3	19.6	0.0
1,000 - 4,999	12,408,286	17.0	0.8	23.6	1.0
5,000 - 9,999	6,512,251	24.0	1.6	28.3	1.7
10,000 and over	17,914,312	45.7	2.2	38.5	2.0
Locale (1987)					
Urban/central cities	10,951,908	56.5	2.2	39.8	1.7
Suburban/metropolitan	18,538,771	21.7	1.8	30.9	2.0
Rural	10,258,395	19.9	0.3	21.0	0.4
Percent minority (1987)					
< 5%	8,965,719	2.3	0.3	(‡)	(‡)
5% - < 20%	10,633,179	11.1	0.9	(‡)	(‡)
20% - < 50%	9,900,843	33.2	2.4	(‡)	(‡)
50% and over	10,249,333	73.9	2.3	(‡)	(‡)
SES (% of school-age children in poverty: 1990)					
0% - < 5%	4,230,872	11.8	1.3	12.3	1.0
5% - < 15%	13,621,811	16.1	1.4	16.6	1.4
15% - < 25%	10,924,850	27.6	1.5	28.1	1.7
25% and over	10,971,541	59.6	1.7	58.3	1.7

NOTE: Numbers in this table are not directly comparable to numbers presented earlier in the chapter because:

(1) Data are provided only for districts that were in existence both in 1987-88 and 1990-91, and

(2) Change data are weighted by the district's 1987-88 enrollment.

(†) Values for *Overall* "Equated Mean % Minority" and "Equated Mean Change" are omitted because they are the same as the simple means, by definition.

(‡) "Equated Mean % Minority (1987-88)" and "Equated Mean Change" values for levels of the factor "Percent Minority (1987)" were omitted since percent minority cannot meaningfully be employed as both a dependent and independent variable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91; U.S. Department of Education, National Center for Education Statistics, School District Data Book Version 1.0, June 1994.

School characteristics. Although there are relationships between district characteristics and school characteristics (as in the case of school and district locale types and school and district sizes), the racial-ethnic composition of a school may be independently related to a specific school characteristic. However, controlling for school-level factors (locale, school type, grade level, and, for change analyses, proportion of minority students in 1987-88), the same basic relationships between changes in the proportion of minority students and the proportion of minority students in these different kinds of schools was observed (see table 3.8). That is, (1) the proportion of minority students in a school increased with school size, and (2) the largest schools had the greatest increases in their proportions of minority students. The strength of these relationships was diminished by controlling for other factors, but was clearly not eliminated.

Table 3.8— Changes in the percentages of minority students in schools in regular districts with different characteristics: 1987-88 to 1990-91

	Number of Students in Analysis (1987-88)	% Minority (1987-88)	Mean Change	Equated Mean % Minority (1987-88)	Equated Mean Change
Overall	38,999,485	30.8	1.7	(†)	(†)
Size (1987)					
0 - 249	2,622,226	18.0	0.2	26.3	1.1
250 - 499	10,511,658	24.7	0.9	27.8	1.3
500 - 999	16,256,990	32.5	1.7	31.3	1.7
1,000 and over	9,608,611	38.2	2.8	34.7	2.2
Locale (1987)					
Large city	5,402,447	72.6	3.0	64.9	2.5
Mid-size city	6,611,351	35.6	2.3	34.4	2.2
Urban fringe of large city	6,571,739	29.0	2.6	28.9	2.4
Urban fringe of mid-size city	4,676,938	22.4	1.9	23.3	1.8
Large town	944,533	21.8	1.3	23.1	1.4
Small town	8,484,721	19.3	0.7	21.7	1.0
Rural	6,307,756	15.1	0.1	18.9	0.6
Type (1987)					
Regular	38,663,620	30.7	1.7	30.8	1.7
Special education	135,494	49.0	2.3	40.3	2.0
Vocational education	109,358	64.0	3.2	42.0	2.0
Alternative education	91,013	36.0	2.9	33.0	2.8
Grade level (1987)					
Elementary	18,208,551	31.9	1.4	32.8	1.5
Middle	6,475,607	31.4	1.5	30.9	1.4
Secondary	11,369,787	27.7	2.2	26.7	1.8
Combined	2,866,185	34.9	1.7	34.4	2.0
Not classifiable	79,355	50.0	2.4	32.2	1.9
Percent minority (1987)					
< 5%	9,848,275	2.1	0.5	(‡)	(‡)
5% - < 20%	10,282,489	11.0	1.2	(‡)	(‡)
20% - < 50%	9,096,796	33.3	2.7	(‡)	(‡)
50% and over	9,771,925	78.3	2.4	(‡)	(‡)

NOTE: Numbers in this table are not directly comparable to numbers presented earlier in the chapter because:
(1) Data are provided only for schools that were in existence both in 1987-88 and 1990-91, and
(2) Change data are weighted by the school's 1987-88 enrollment.

(†) Values for *Overall* "Equated Mean % Minority (1987-88)" and "Equated Mean Change"are omitted because they are the same as the simple means, by definition.

(‡) "Equated Mean % Minority" and "Equated Mean Change (1987-88)" values for levels of the factor "Percent Minority (1987)" were omitted since percent minority cannot meaningfully be employed as both a dependent and independent variable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

The school's locale (analogous to the district metropolitan status or urbanicity code, but using seven instead of three locale categories) was the school characteristic most strongly associated with its racial-ethnic composition (percentage of minorities), even controlling for other factors. Both levels in 1987-88 and increases in the proportion of minority students were greatest in large cities and in their urban fringes, whether or not controlling for other school characteristics.

Without compensating for other school characteristics, the proportion of minority students in vocational schools in 1990-91 (64 percent), in special education schools (49 percent), and in alternative schools (36 percent) was much higher than the proportion of minority students in regular schools (31 percent). Controlling for school size, locale, and grade level reduced these differences appreciably. The apparent 33.3 percent (64.0 percent - 30.7 percent) discrepancy between the minority composition of vocational education and regular schools was only an 11.2 percent (42.0 percent - 30.8 percent) discrepancy when accounting for these other factors.

The proportion of minority students in a school is associated with the grade levels served. In 1987-88, as the population served aged, the proportion of minority students decreased, from 32 percent in elementary schools to 31 percent in middle schools to 28 percent in high schools. Controlling for other school characteristics, these discrepancies were larger. It is clear that the proportion of minority high school students was less than the proportion of minority elementary school students, independent of other school characteristics. Two factors are associated with this effect:

- The dropout rate for minority students is greater than the dropout rate for white non-Hispanic students (McMillen, Kaufman, and Whitener 1994; McLaughlin and Levine 1992).

- Higher birthrates and immigration rates for young minority families are associated with a disproportionate increase in the number of younger minority children.

Increases in the proportions of minority students in elementary, middle, and secondary schools were quite similar, particularly after adjusting for other factors. The larger increase at the high school level suggests an improvement in dropout prevention for minority students.

As was the case with school districts, schools with the greatest proportion of minority students (20 percent or more) had the greatest increases in their proportions of minority students. However, controlling for other factors reduced this divergence noticeably.

Questions for Further Research

From 1987-88 to 1990-91, the public school population in the United States increased by about one million students. Newer students entering the public school system were much more likely to be nonwhite students: enrollments of Hispanic students increased by about 670,000; enrollments of Asians, by about 150,000.

Minority students are concentrated in certain kinds of school districts. In 1990-91, most of the nation's minority students were enrolled in school districts serving at least 10,000 students. Although these districts served less than half (46 percent) of the nation's students, they served over two-thirds (69 percent) of the nation's black and Hispanic students and over 70 percent of the nation's Asian students. Further, increases in minority composition were greatest in the large cities. As the proportion of white non-Hispanic students in large city schools continues to diminish, several questions are raised:

> *Is the decline in the proportion of white non-Hispanic students in these schools commensurate with the decline of white school-age children in the areas served by these schools?*
>
> *Will these declines continue at their current rate?*
>
> *How has the racial-ethnic composition of urban private school students changed relative to urban public school students?*

The education system might respond to changes in the composition of its student mix by offering special programs, such as limited English proficient (LEP) programs. From 1987-88 to 1990-91, there were disproportionate increases in the minority composition of students attending specialized (special education, vocational education, and alternative education) schools. These increases raise the following questions:

> *Why are minority students more likely to attend specialized schools—even when controlling for other characteristics of the education system?*
>
> *Is this a systemic response to changes in racial-ethnic composition?*

4 How Has the Racial Balance Within School Districts Changed?

Overview

Changes in both the overall student body composition of our schools and the distribution of racially and socially diverse students between and within schools can have profound impacts on the nation's education system. Many believe that effective school organization structures must reflect the demographic characteristics of the population of students being served (Lee, Bryk, and Smith 1993).

The racial-ethnic composition (as well as the socioeconomic diversity) of a class or a school can significantly influence instructional practices. Viewing heterogeneity as a resource (especially for tasks such as peer learning and cooperative tutoring), diversity can be seen as an asset at the classroom level (Barr and Dreeben 1983). Coleman et al. (1966) reported that minority student achievement is increased in racially integrated schools. Similarly, Mahard and Crain (1983) showed lasting IQ improvements in minority students as a result of desegregation. Gains were greatest for minority students with the greatest exposure to whites. Other researchers have suggested the existence of optimal ranges of racial-ethnic composition (Schofield and Sagar 1983). Although desegregation of schools does not guarantee desegregation of classes, or even education improvement, there is substantial evidence that racial-ethnic composition of schools can influence education outcomes.

In the 1986-87 to 1990-91 period, substantial amounts of money were spent to improve the racial balance of the nation's public schools.[28] From 1985 through 1991, just through the Magnet Schools Assistance Program, the federal government provided over $739 million to school districts to support existing magnet programs and to encourage the development of new magnet programs (Steel and Levine 1994). One of the major goals of this program was the improvement of intra-district racial balance. Through state and local programs, even greater amounts have been spent, in response to court orders and public pressures to improve school districts' racial balance. The overall success of these efforts, as well as the types of districts showing the greatest changes in racial balance, were investigated for this report. Results of these investigations follow.

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[28] "Racial balance" refers to the uniformity of minority student concentrations across schools in the same district. In this report, "minority" refers to students identified as either Native American, Asian, Hispanic, or black.

Methodology

Many different measures are employed in studies of intradistrict racial balance and desegregation, each focusing on different aspects of the problem. CCD data were used to calculate two of the most commonly used measures to assess desegregation effectiveness—the index of racial imbalance and the index of (minority) racial exposure.[29] These two measures are in common use in the desegregation research field and in courts of law. They were used to determine how specific types of districts differed and how they changed from 1987-88 to 1990-91.

Description of measures. The intradistrict *racial imbalance* measure (see Appendix A for a full description) provides an indication of the minimum percentage of minority students in a district that would have to be transferred to other schools to achieve "perfect" racial balance.[30] This measure can range from 0 (indicating perfect racial balance) to 100 (indicating total segregation).[31] Since this is a measure of *im*balance, lower measures indicate better racial balance.

This measure compares the racial-ethnic composition (percentage of minority students) of each school in a district with the district's overall racial-ethnic composition. Racial imbalance measures are only appropriate for districts that have more than one school serving students at a particular grade level. That is, if a district only has one school, the minority proportion in the school must match the minority proportion in the district.

Pragmatically, if a district is comprised of an elementary school, a middle school, and a high school, it is improbable that each of these schools would have exactly the same proportion of white students. (As was previously shown, the proportion of minority students was greater at the lower grade levels during this period). If a racial imbalance measure was calculated for such a district, the measure would most probably indicate some imbalance. However, this kind of imbalance cannot be reduced by transferring students between schools. Therefore, racial imbalance measures were only calculated for districts in which viable desegregation strategies could be implemented: districts with more than one regular school serving students at the same grade level.

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[29] The index of racial balance, also known as the index of dissimilarity, was developed by Karl and Alma Taueber, *Negroes in Cities* (Chicago: Aldine, 1965). It has been used in numerous studies of school and residential racial-ethnic imbalance. Some examples include Farley, 1981; Farley, Wurdock, and Richards 1980; Smylie 1983; Van Valey, Roof, and Wilcox 1977. The index of interracial exposure has been used in more recent studies, to estimate the effectiveness of desegregation plans. Examples of its use include Farley 1981; Orfield 1982; Orfield and Monfort 1986; Rossell 1979; Rossell 1986a; Rossell 1986b, and Orfield 1986.

[30] Perfect racial balance means that the percentage of minority students in each school is equal to the overall percentage of minority students in the district. The interpretation of this index as a *minimum* assumes that only minority students would be reassigned and that no white students would be reassigned.

[31] If a district is 100 percent white or 100 percent minority, the denominator for calculating racial-ethnic imbalance becomes 0, and the imbalance is undefined. Districts that are 100 percent white or 100 percent minority were assigned imbalance scores of 0 percent since no students would have to be transferred to bring about "perfect" racial balance in the district. It should be noted that higher numbers mean greater imbalance; lower numbers, better racial-ethnic balance.

The *racial exposure* measure (see Appendix A for the calculation of the formula) indicates the percentage of white students that attend the typical minority student's school. It can range from 0 (indicating that there are no white students in the typical minority student's school) to < 100 (a single minority student and all other students white). Higher values indicate greater exposure of minority students to white students. The racial exposure measure is sensitive to and is limited by the district's racial-ethnic composition; if a district is 10 percent white, the weighted racial exposure measure for this district cannot exceed 10 percent.

Racial exposure measures are meaningful for districts that have only a single school as well as districts that serve more than one regular school at a given grade level. For purposes of comparability, racial exposure measures for districts with more than one school at a given grade level are presented in this chapter.

Racial exposure measures are presented both as district averages and weighted by the number of minority students in a district. The unweighted district average is the sum of all of these measures divided by the total number of school districts. It provides an indication of the proportion of white students in a typical school district (regardless of the district's size). Since racial-ethnic composition (i.e., proportion minority students) is associated with district size, this simple district average does not describe racial exposure from the perspective of the typical minority student. For this reason, weighted racial exposure means are also presented. The weighted measure shows the proportion of students who are white in the average minority student's school. The maximum value for the weighted mean is the percentage of white non-Hispanics in the school population.

In the following tables, both racial balance and racial exposure proportions have been multiplied by 100 and are presented as percentages.

Summary of Findings

- *Using two different measures of desegregation success (changes in the index of racial imbalance and the index of minority exposure), there is evidence of slight desegregation improvements from 1987-88 to 1990-91.*

- *In the typical urban school district in 1990-91, it would have been necessary to move over one-quarter of the white non-Hispanic students to other schools to achieve perfect racial balance in the district.*

- *In 1990-91, the most racially unbalanced districts were those with the highest proportion of minority students in 1987-88. Improvements in these districts' racial balance from 1987-88 to 1990-91 were minimal, at best.*

- *The most affluent school districts in 1987-88 (that is, those with the lowest percentage of school-age children in poverty) had the greatest declines in their minority exposure index from 1987-88 to 1990-91. This negative effect remained even after controlling for other district characteristics.*

Detailed Description of Findings

General desegregation trends. From 1987-88 to 1990-91, there was little evidence of overall improvement in desegregation within school districts. In districts with more than one regular school serving students at a given grade level, racial imbalance in the typical district improved very slightly, decreasing from 18.9 percent to 18.8 percent. (In other words, in 1990-91, 18.8 percent of the "minority" students in the typical district would have had to be transferred to other schools to bring about perfect racial balance.)

Racial exposure measures provided equivocal information. From the perspective that increases in racial exposure are positive indicators of desegregation success, the weighted and unweighted decreases from 1987-88 to 1990-91 are negative results. From 1987-88 to 1990-91, the proportion of white children in the typical minority student's school declined by 1 percent (from 37 percent to 36 percent). However, this measure is effectively limited by the proportion of white non-Hispanic students in a district and was substantially due to a decline in the proportion of school children nationally who are white non-Hispanic. Since the nationwide proportion of white school children declined by 1.4 percent—more than the 1.0 percent decline in the percentage of white non-Hispanic students in the typical minority student's school—over this time period, it can be argued that the decline was not as large as might have been expected. (see table 4.1).

Table 4.1— Racial imbalance and racial exposure in regular districts with more than one regular school serving students at a given grade level, overall: 1987-88 to 1990-91

	Number of Students	Number of Students for Imbalance	Number of Students for Exposure	Racial Imbalance	Racial Exposure	Racial Exposure (Weighted)
1987-88	39,963,281	35,484,780	35,409,227	18.9	80.3	37.0
1988-89	40,120,672	35,772,049	35,714,936	18.5	79.5	37.0
1989-90	40,408,326	35,895,979	35,843,964	18.7	79.3	36.4
1990-91	40,911,261	36,346,241	36,273,076	18.8	78.8	36.0

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

District metropolitan status. Throughout the 1987-88 to 1990-91 period, within-district racial imbalance was greatest in urban districts and lowest in suburban districts (see table 4.2). Racial exposure, reflecting the lower proportions of white students, was also the lowest in these urban districts. The 1990-91 weighted racial exposure index of 24.3 percent means that in the typical urban school, less than one-quarter (24.3 percent) of the students to which the typical minority student was exposed were white.[32]

In 1990-91, the typical urban district had a racial imbalance index of 25.1 percent, meaning that one-quarter of the minority students would have to be reassigned to other schools within the district to bring about perfect district racial balance.

District size. From 1987-88 to 1990-91, the largest school districts (those with enrollments of 10,000 and over) were the most racially imbalanced districts. All but the smallest (enrollment of less than 1,000) school districts showed slight overall improvements in their racial balance (see table 4.3).

Racial exposure measures for districts serving fewer than 10,000 students were all quite comparable. On the other hand, in the typical large district (in 1990-91), the representative minority student was attending a school that was less than one-third (31 percent) white. In the usual district of this size, the representative minority student was in a school that was approximately 50 percent white (see table 3.5).

Racial-ethnic composition. The racial-ethnic composition of a district (i.e., its percentage of minorities in 1987) was strongly associated with its levels of racial imbalance and racial exposure. Districts with the highest and lowest proportions of minority students were the most racially imbalanced districts; those with between 5 percent and 50 percent minority were the most racially balanced. In districts with low proportions of minority students (less than 5 percent), higher racial imbalance indices did not represent serious problems. In these districts, the racial imbalance index represents the proportion of minority students who would have to have been transferred to ensure perfect racial balance. In a district that was 4.9 percent minority (the maximum possible in this category), a racial imbalance index of 21.8 percent means that 21.8 percent of the minority students (comprising only 4.9 percent of the district's enrollment), or 1.1 percent of the district's total enrollment, would have to have been transferred to ensure perfect racial balance (see table 4.4).

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[32] In 1990-91, white students comprised 42 percent of the urban school enrollment. This percentage is the maximum racial exposure to whites that can be achieved in urban districts. SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys, 1990-1991.

Table 4.2— Racial imbalance and racial exposure in regular districts with more than one regular school serving students at a given grade level, by metropolitan status: 1987-88 to 1990-91

	Number of Students for Imbalance Analysis	Number of Students for Exposure Analysis	Racial Imbalance	Racial Exposure	Racial Exposure (Weighted)
Overall					
1987-88	35,484,780	35,409,227	18.9	80.3	37.0
1988-89	35,772,049	35,714,936	18.5	79.5	37.0
1989-90	35,895,979	35,843,964	18.7	79.3	36.4
1990-91	36,346,241	36,273,076	18.8	78.8	36.0
Metropolitan status					
Urban/central cities					
1987-88	10,700,025	10,700,025	25.6	58.1	25.2
1988-89	10,736,681	10,736,681	25.2	57.5	25.2
1989-90	10,700,565	10,700,565	25.3	56.9	24.7
1990-91	10,793,012	10,793,012	25.1	56.4	24.3
Suburban/metropolitan					
1987-88	17,009,853	16,991,340	17.3	82.7	50.8
1988-89	17,149,749	17,130,603	17.1	82.0	50.3
1989-90	17,295,099	17,282,096	17.0	81.3	49.3
1990-91	17,675,399	17,665,207	16.9	80.9	48.3
Rural					
1987-88	7,774,902	7,717,862	19.5	81.1	48.3
1988-89	7,885,619	7,847,652	18.8	80.4	48.4
1989-90	7,900,315	7,861,303	19.4	80.7	47.7
1990-91	7,877,830	7,814,857	19.8	80.3	47.3

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

Table 4.3— Racial imbalance and racial exposure in regular districts with more than one regular school serving students at a given grade level, by size: 1987-88 to 1990-91

	Number of Students for Imbalance Analysis	Number of Students for Exposure Analysis	Racial Imbalance	Racial Exposure	Racial Exposure (Weighted)
Overall					
1987-88	35,484,780	35,409,227	18.9	80.3	37.0
1988-89	35,772,049	35,714,936	18.5	79.5	37.0
1989-90	35,895,979	35,843,964	18.7	79.3	36.4
1990-91	36,346,241	36,273,076	18.8	78.8	36.0
Size					
0 - 999					
1987-88	736,036	702,858	17.0	84.4	52.2
1988-89	754,288	731,325	16.8	84.0	52.8
1989-90	703,365	671,195	17.4	83.6	49.1
1990-91	671,932	628,428	17.9	83.3	48.6
1,000 - 4,999					
1987-88	10,596,149	10,553,774	18.0	83.5	52.9
1988-89	10,646,513	10,612,363	17.4	82.6	52.5
1989-90	10,592,995	10,573,150	17.7	82.6	51.5
1990-91	10,500,417	10,470,756	17.7	82.4	51.0
5,000 - 9,999					
1987-88	6,495,298	6,495,298	20.1	73.7	48.4
1988-89	6,398,986	6,398,986	19.9	73.1	48.3
1989-90	6,440,945	6,440,945	19.7	71.8	47.3
1990-91	6,383,973	6,383,973	19.6	72.8	47.0
10,000 and over					
1987-88	17,972,262	17,972,262	26.1	60.7	31.1
1988-89	17,657,297	17,657,297	26.4	61.1	31.2
1989-90	18,215,646	18,215,646	25.9	60.2	30.9
1990-91	18,732,947	18,732,947	25.8	59.5	30.6

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

Table 4.4— Racial imbalance and racial exposure in regular districts with more than one regular school serving students at a given grade level, by racial-ethnic composition in 1987-88: 1987-88 to 1990-91

	Number of Students for Imbalance Analysis	Number of Students for Exposure Analysis	Racial Imbalance	Racial Exposure	Racial Exposure (Weighted)
Overall					
1987-88	35,484,780	35,409,227	18.9	80.3	37.0
1988-89	35,772,049	35,714,936	18.5	79.5	37.0
1989-90	35,895,979	35,843,964	18.7	79.3	36.4
1990-91	36,346,241	36,273,076	18.8	78.8	36.0
Percent minority					
0 - < 5%					
1987-88	7,011,664	6,936,111	22.1	97.1	95.7
1988-89	6,625,380	6,568,267	21.6	97.1	95.7
1989-90	6,715,749	6,663,734	21.6	97.2	95.8
1990-91	6,763,471	6,690,306	21.8	97.2	95.8
5 - < 20%					
1987-88	9,609,221	9,609,221	15.0	87.7	83.4
1988-89	9,696,482	9,696,482	15.3	87.7	83.5
1989-90	9,509,634	9,509,634	15.2	87.6	83.4
1990-91	9,270,688	9,270,688	15.2	87.2	83.3
20% - < 50%					
1987-88	9,160,655	9,160,655	15.2	63.8	58.8
1988-89	9,439,758	9,439,758	14.7	64.2	58.9
1989-90	9,544,192	9,544,192	15.1	63.7	58.4
1990-91	9,853,645	9,853,645	14.8	63.8	58.2
50% and over					
1987-88	9,703,240	9,703,240	24.3	25.8	19.4
1988-89	10,010,429	10,010,429	23.0	26.0	19.7
1989-90	10,126,404	10,126,404	23.3	25.3	19.1
1990-91	10,458,437	10,458,437	23.1	25.4	18.9

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

SES. Racial imbalance was greater and racial exposure was lower in the least affluent districts from 1987-88 to 1990-91. Although some slight improvement occurred in racial balance in the poorest districts during this time period, there was no evidence of consistent improvement (see table 4.5).

The greatest declines in minority exposure to white non-Hispanic students (racial exposure) occurred in the most affluent districts. Since minority exposure measures reflect the proportion of white students in a district, a decline of 3.5 percent (69.7 percent - 66.2 percent) in the racial exposure measure could be produced by a decline of 3.5 percent in the number of white students in the district, with all other factors remaining the same. However, the proportion of white students in the most affluent districts only decreased by 1.4 percent (see table 3.3). Most of the decrement was due to factors other than the district's loss of white non-Hispanic students.

Changes in racial imbalance as a function of district characteristics. Multivariate analyses (general linear models) were employed to identify the relationships between specific district characteristics and both the absolute levels of racial imbalance (in 1987-88) and changes in this measure (from 1987-88 to 1990-91). These analyses provide scant evidence of improvement in racial balance over this time period (see table 4.6).

Size. From 1987-88 to 1990-91, district size was strongly associated with racial imbalance levels whether or not controlling for other district characteristics (district metropolitan status, percentage of minorities, and SES): The larger the district, the greater the degree of imbalance. The importance of this factor is made even more evident when controlling for other district characteristics. Although districts with fewer than 1,000 students had the least imbalance in 1987-88 among multischool districts (imbalance index=17), unlike larger districts they became slightly more imbalanced (an increase of 1 in the index) during the next 3 years.[33]

SES. Although the basic relationships between SES and racial imbalance (i.e., racial imbalance decreases with increasing affluence) remained after controlling for other district characteristics, the differences between the richest and poorest districts were slightly diminished from 1987-88 to 1990-91. Racial imbalance was clearly associated with district poverty. When controlling for other district characteristics, only very small changes were found in racial imbalance for any of these different types of districts during this 3-year period.

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[33] Changes of less than ± 0.05 are indicated as "0.0."

Table 4.5— Racial imbalance and racial exposure in regular districts with more than one regular school serving students at a given grade level, by SES (percentage of population in poverty): 1987-88 to 1990-91[a]

	Number of Students for Imbalance Analysis	Number of Students for Exposure Analysis	Racial Imbalance	Racial Exposure	Racial Exposure (Weighted)
Overall					
1987-88	35,378,124	35,303,068	18.9	80.3	37.0
1988-89	35,747,007	35,690,271	18.5	79.5	37.0
1989-90	35,895,979	35,843,964	18.7	79.3	36.4
1990-91	36,341,436	36,268,457	18.8	78.8	36.0
Percentage of school-age children in poverty: 1990					
0 - < 5%					
1987-88	3,858,208	3,856,499	15.4	88.7	69.7
1988-89	3,904,635	3,901,610	15.7	88.3	68.7
1989-90	3,943,867	3,942,813	15.0	87.8	67.4
1990-91	4,012,121	4,011,761	15.4	87.5	66.2
5 - < 15%					
1987-88	12,034,486	12,004,414	18.1	87.1	61.6
1988-89	12,157,095	12,136,024	17.8	86.7	61.1
1989-90	12,295,593	12,280,161	18.0	86.2	59.9
1990-91	12,531,874	12,509,222	17.9	85.7	58.7
15% - < 25%					
1987-88	9,668,448	9,643,039	19.4	81.2	46.2
1988-89	9,763,613	9,744,005	18.9	80.8	45.7
1989-90	9,838,322	9,819,843	19.0	80.7	44.6
1990-91	9,992,406	9,960,570	19.4	80.3	43.7
25% and over					
1987-88	9,816,982	9,799,116	22.5	57.1	21.8
1988-89	9,921,664	9,908,632	21.2	56.5	21.9
1989-90	9,818,197	9,801,147	22.1	56.1	21.2
1990-91	9,805,035	9,786,904	22.2	55.3	20.7

[a] Only districts for which SES data were available are included in these analyses.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91; U.S. Department of Education, National Center for Education Statistics, School District Data Book Version 1.0, June 1994.

Table 4.6— Changes in racial imbalance in regular districts with more than one school serving students at a given grade level, as a function of district characteristics: 1987-88 to 1990-91[a]

	Number of Students in Analysis	Racial Imbalance (1987-88)	Change Racial Imbalance	Equated Mean Racial Imbalance (1987-88)	Equated Mean Change Racial Imbalance
Overall	34,733,082	19.3	-0.0	(†)	(†)
Size (1987)					
0 - 999	553,332	17.7	1.2	17.0	1.0
1,000 - 4,999	10,048,616	18.3	-0.2	18.2	-0.1
5,000 - 9,999	6,473,837	20.1	-0.1	20.8	-0.2
10,000 and over	17,657,297	26.4	0.1	26.5	0.0
Metropolitan status (1987)					
Urban/central cities	10,680,805	25.7	-0.1	21.4	-0.2
Suburban/metropolitan	16,660,908	17.5	-0.4	18.2	-0.2
Rural	7,391,369	20.2	0.5	19.2	0.7
Percent minority (1987)					
< 5%	6,620,794	22.6	-1.3	24.1	-1.4
5% - < 20%	9,417,628	15.4	1.8	16.1	1.8
20% - < 50%	9,051,538	15.7	-0.3	13.5	-0.1
50% and over	9,643,122	24.9	-0.1	20.9	0.1
SES (% of school-age children in poverty: 1990)					
0% - < 5%	3,784,058	15.6	0.0	16.0	0.5
5% - < 15%	11,764,972	18.3	-0.1	18.3	0.1
15% - < 25%	9,483,838	19.8	0.3	20.0	0.1
25% and over	9,700,214	23.5	-0.1	22.8	-0.4

[a] Only districts for which SES data were available are included in these analyses.

NOTE: Numbers in this table are not directly comparable to numbers presented earlier in the chapter because data are provided only for districts that were in existence both in 1987-88 and 1990-91.

(†) Values for *Overall* "Equated Mean Racial Imbalance (1987-88)" and "Equated Mean Change Racial Imbalance" are omitted because they are the same as the simple means, by definition.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91; U.S. Department of Education, National Center for Education Statistics, School District Data Book Version 1.0, June 1994.

Other district characteristics. From 1987-88 to 1990-91, racial imbalance was highest in urban districts and lowest in suburban districts. However, this difference was largely indirect; controlling for other factors, the difference was less than half as large. Racial imbalance was also related to a district's minority composition. Racial imbalance was highest in the districts with the highest and lowest proportions of minority students. As previously noted, the relatively high levels of racial imbalance in the districts with minority compositions of less than 5 percent should not be considered serious problems on a pragmatic level. However, this is not true of the high levels in districts that are at least 50 percent minority.

There was improvement (reduction) in racial imbalance between 1987-88 and 1990-91 in districts with fewer than 5 percent minorities, but this was matched by an increase in racial imbalance in districts with between 5 and 20 percent minorities and in rural districts. Generally, the changes in the racial imbalance index during these years were much smaller than both the values of the index and the differences between different categories of districts.

Changes in racial exposure as a function of district characteristics. As with racial imbalance changes, multivariate analyses (general linear models) were employed to identify the relationships between specific district characteristics and both the absolute levels of racial exposure (in 1987-88) and changes in this measure (from 1987-88 to 1990-91). The decline in minority exposure to white non-Hispanic students over this time period reflects an overall decline in the proportion of white students in the student population. The racial exposure index is limited by the proportion of white students in a district. With fewer white non-Hispanic students in a district, the proportion of white non-Hispanic students in the typical minority student's school would naturally be expected to decrease. Nonetheless, these changes were associated with specific district characteristics in a clear and consistent fashion (see table 4.7).

SES. Other than the percent minority in the district, socioeconomic status was the factor most strongly associated both with levels of racial exposure in 1987-88 and with changes in these levels. Districts with the fewest school-age children in poverty had the highest levels of racial exposure, and controlling for percent minority, this relationship was still apparent—the average racial exposure index in the most affluent districts was 42.5, compared to 34.1 in the least affluent districts. Although the most affluent districts had the greatest levels of racial exposure in 1987-88, they also had the largest declines from 1987-88 to 1990-91 (adjusted, - 4.6 percent and -4.1 percent; unadjusted, both -2.8 percent). This trend can be only weakly related to changes in the proportions of white non-Hispanic students in these affluent districts; these districts had adjusted declines of only 1.5 percent and 1.6 percent in their proportions of white students over this time period. These changes were substantially greater than the decrease in white student enrollments and must be attributed to other factors. The changes were also independent of factors such as district size, metropolitan status, and percentage of minorities. Using racial exposure changes as an indicator of desegregation trends, the most affluent districts performed worst from 1987-88 to 1990-91.

Other district characteristics. Simple crosstabulations indicate higher racial exposure in small districts and in suburban and rural districts. However, among districts with similar concentrations of minority students, the equated means in table 4.7 indicate that there was very little variation in racial exposure between large and small or urban and rural districts.

Since racial exposure indices are heavily constrained by the proportion of white non-Hispanic students in a district, strong relationships between this measure and a district's racial-ethnic composition must be observed; however, this is not true of changes. The changes in this measure closely mirror the changes in these types of districts' proportion of minority students (as presented in table 4.7). The districts showing the largest unadjusted and adjusted increases in the proportion of minority students (i.e., those with minority compositions of at least 20 percent) showed the greatest declines in their racial exposure measures.

Table 4.7— **Changes in racial exposure in regular districts with more than one school serving students at a given grade level, as a function of district characteristics: 1987-88 to 1990-91[a]**

	Number of Minority Students in Analysis (1987-88)	Racial Exposure (1987-88)	Change in Racial Exposure	Equated Mean Racial Exposure (1987-88)	Equated Mean Change in Racial Exposure
Overall	11,353,374	36.8	-2.0	(†)	(†)
Size (1987)					
0 - 999	76,988	50.7	-0.3	36.9	-1.0
1,000 - 4,999	1,679,389	52.6	-1.6	38.0	-2.1
5,000 - 9,999	1,553,429	48.5	-2.3	37.8	-2.6
10,000 and over	8,043,568	31.1	-2.1	36.4	-1.9
Metropolitan status (1987)					
Urban/central cities	6,026,180	25.2	-1.9	36.6	-2.1
Suburban/metropolitan	3,761,500	50.7	-2.7	36.3	-2.6
Rural	1,565,694	48.1	-0.7	39.0	-0.4
Percent minority (1987)					
< 5%	161,673	95.6	-0.4	80.4	0.2
5% - < 20%	1,046,544	83.3	-1.3	71.3	-0.6
20% - < 50%	3,008,596	58.7	-2.5	53.0	-0.2
50% and over	7,136,561	19.4	-1.9	23.9	-0.2
SES (% of school-age children in poverty: 1990)					
0% - < 5%	457,697	69.7	-2.8	42.5	-4.6
5% - < 15%	2,040,780	61.5	-2.8	41.2	-4.1
15% - < 25%	2,819,122	46.0	-2.2	38.5	-2.3
25% and over	6,035,775	21.6	-1.6	34.1	-1.0

[a] Only districts for which SES data were available are included in these analyses.

NOTE: Numbers in this table are not directly comparable to numbers presented earlier in the chapter because:
(1) Data are provided only for schools that were in existence both in 1987-88 and 1990-91, and
(2) Change data are weighted by the school's 1987-88 minority enrollment.

(†) Values for *Overall* "Equated Mean Racial Exposure (1987-88)" and "Equated Mean Change in Racial Exposure" are omitted because they are the same as the simple means, by definition.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91; U.S. Department of Education, National Center for Education Statistics, School District Data Book Version 1.0, June 1994.

Questions for Further Research

Underlying analyses of racial-ethnic composition and changes is a belief that there is a relationship between racial-ethnic composition and education quality. In order to promote racial balance in the public school system, billions of dollars have been spent in the past decade. In spite of these efforts, improvements in the overall racial balance of the nation's public school system have been slight. Answers to the following questions could shed further light on the success of desegregation efforts and processes.

How has the distribution of students of different racial-ethnic groups changed? That is, has the racial imbalance of specific groups (for example, Asians) changed disproportionately to that of other racial-ethnic groups?

How has the racial exposure (to white non-Hispanic students) of members of different minority groups changed?

If there are differential changes in these measures for members of specific minority groups, with what district and school characteristics are they associated?

How have specific programs designed to improve racial balance (such as the Magnet Schools Assistance Program) affected the racial balance of the schools and districts receiving this support?

Why have the most affluent districts had the greatest declines in their minority racial exposure indices?

Are racial exposure and racial imbalance indices similar across regions of the United States, and are these indices for county districts similar to other districts?

What relationships exist between these racial distribution indicators and characteristics such as district size and metropolitan area size, both within and across different regions of the United States?

5 How Have Student/Teacher Ratios Changed?

Overview

Student/teacher ratios are often used as indicators of education resource distribution. Since 85 percent of public education expenditures go to staff salary and benefits (Chambers 1993),[34] these ratios reflect a major education cost in a way that permits comparisons among agencies and schools.

Student/teacher ratios are also directly responsive to policy activity at both the state and district levels. By mandating changes in these ratios, policymakers can directly affect the delivery of education services. Nearly half (47 percent) of the states and 41 percent of school districts have policies prescribing class sizes for their high schools.[35] Since 1980, the general trend has been to decrease class size (i.e., to decrease student/teacher ratios) (Levine 1995; Levine, Arcilla, and Furtado 1995). This reflects a belief about education practices: small(er) class sizes are generally better than larger class sizes, because more individualized attention can be given to each student. Research findings are generally consistent with this belief (Finn and Achilles 1990; Slavin 1989; Glass and Smith 1979).[36] Acceptance of this belief permits the use of class size as an indicator of education quality. The CCD has not collected data on class size, but it provides information on a related measure: student/teacher ratios. Although a percentage of teachers in any large district may not be teaching self-contained classes, the student/teacher ratio is highly correlated with class size.

In order to determine whether the nation's public schools are moving in directions consistent with acceptance of this belief, and to determine the types of districts that are moving in such directions, comparisons of student/teacher ratios in different types of school districts over time were made. These comparisons are also informative about changes in resource distribution policies and practices, both over time and as a function of district characteristics.

Even when mandated state and district policies related to student/teacher ratios are in place, the implementation of these policies is not always consistent across all schools. Certain school characteristics (particularly size) are logically associated with these ratios. For example, an elementary school with only 12 third graders can try to combine grades with a single teacher serving more than one grade, or it can provide 1 teacher to serve these 12 students. The impact of specific school characteristics was also investigated.

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[34] According to the 1988-89 National Public Education Finance Survey, teachers' salaries and benefits represent 52.8 percent of total (noncapital) expenditures; total personnel costs, 79.7 percent. It was estimated that another 5 percent should be added to these figures to account for the portion of purchased services that are allocated to personal service contracts.

[35] Class size and student/teacher ratio are related, but not identical, concepts. State and district policies are generally manifested in terms of regulations about class size rather than student/teacher ratios. All other things being equal, class size policies will have an effect on student/teacher ratios.

[36] For a contrasting opinion, see Tomlinson, T. (1988). *Class Size and Public Policy: Politics and Panaceas.* U.S. Department of Education, Office of Educational Research and Improvement, PIP 88-838.

Methodology

The CCD Surveys do not request teacher counts from school districts. Instead, the numbers of teachers employed by each school in the district are aggregated to serve as an indicator of the number of teachers employed by the district.[37] In preparing overall and category means, student/teacher ratios were weighted by the number of teachers in the district (or school). In other words, the overall student/teacher ratio is equal to the total number of students in the districts analyzed divided by the total number of teachers in these districts. Similarly, the mean student/teacher ratio for districts of a particular type (e.g., urban districts) represents the total number of students in this type of district divided by the total number of teachers in this type of district.

Summary of Findings

- *The average student/teacher ratio declined by 4 percent (from 18.0 to 17.3 percent) from 1986-87 to 1990-91.*

- *From 1986-87 to 1990-91, high school student/teacher ratios were strongly associated with school size; overall student/teacher ratios were strongly associated with district size. Larger student/teacher ratios were associated with larger districts and with larger high schools; smaller ratios, with smaller districts and smaller high schools.*

- *For each year from 1986-87 through 1990-91, urban districts and high schools in large cities had the highest student/teacher ratios; rural districts and high schools in rural areas had the lowest student/teacher ratios.*

- *Student/teacher ratios were lowest in the most affluent districts from 1986-87 to 1990-91. Student/teacher ratios were similar in districts with all other affluence levels.*

- *During this period, student/teacher ratios were related to the proportion of minority students in a district. Schools with the highest concentrations of minority students had the highest student/teacher ratios. This difference occurred independently of all other district characteristics investigated.*

- *Student/teacher ratios were higher in elementary schools than in high schools during the time period studied.*

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[37] As a result of rounding, the aggregated number of teachers underestimates the total number of teachers in many districts. CCD district files also contain some districts for which enrollment counts are provided, but for which there are no linkable schools. The procedures employed to deal with these situations and their prevalence are discussed in Appendix B. Because of these procedures, the numbers of teachers reported in this section may not be directly comparable with those in other reports.

- *Student/teacher ratios were lowest in special education schools from 1986-87 to 1990-91. Although the vast majority of special education students were served by regular schools, those whose needs could not be met in regular schools attended specialized schools with very low student/teacher ratios.*

Detailed Description of Findings

General trends in student/teacher ratios. As indicated in table 5.1, the number of teachers increased every year from 1986-87 through 1990-91. Student enrollments also increased over this period (see table 1.3); however, proportionally, increases in the number of teachers exceeded increases in student enrollments. As a result, the average district student/teacher ratio declined consistently over the 1986-87 to 1990-91 period.[38]

District metropolitan status. From 1986-87 through 1990-91, a consistent pattern was found between student/teacher ratios and a district's metropolitan status or urbanicity. Rural districts had the lowest student/teacher ratios, and urban districts had the highest ratios (see table 5.2). The differences were small, ranging from 16.4 to 18.6.

Declines in the student/teacher ratios in all types of districts of slightly less than one student per teacher characterized the 1986-87 to 1990-91 period. Over this period, the difference between these ratios in urban and rural districts remained about 1.4 students per teacher.

Table 5.1— Student/teacher ratios in regular districts: 1986-87 to 1990-91

	Number of Teachers in Analysis	Student/Teacher Ratio
1986-87	2,201,351	18.0
1987-88	2,246,968	17.6
1988-89	2,264,280	17.6
1989-90	2,317,646	17.4
1990-91	2,362,257	17.3

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

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[38] Student/teacher ratios are rounded to the nearest tenth. In 1987-88, the student/teacher ratio, rounded to the nearest hundredth, was 17.65; in 1988-89, 17.57.

Table 5.2— Student/teacher ratios of regular districts, by metropolitan status: 1986-87 to 1990-91

	Number of Teachers in Analysis	Student/Teacher Ratio
Overall		
1986-87	2,201,351	18.0
1987-88	2,246,968	17.6
1988-89	2,264,280	17.6
1989-90	2,317,646	17.4
1990-91	2,362,257	17.3
Metropolitan status		
Urban/central cities		
1986-87	633,523	18.6
1987-88	593,473	18.3
1988-89	597,369	18.1
1989-90	610,771	17.8
1990-91	622,935	17.7
Suburban/metropolitan		
1986-87	959,441	18.1
1987-88	1,042,854	17.8
1988-89	1,054,458	17.7
1989-90	1,074,765	17.6
1990-91	1,100,933	17.6
Rural		
1986-87	608,387	17.1
1987-88	610,641	16.8
1988-89	612,452	16.8
1989-90	632,110	16.5
1990-91	638,390	16.4

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

District size. There is a strong relationship between district size and student/teacher ratios (see table 5.3). From 1986-87 to 1990-91, student/teacher ratios increased with increasing district size. Student/teacher ratios were always highest in the largest districts and diminished with decreasing district size.

Smaller schools tended to be in smaller districts; large schools, in larger districts. (Schools with more than 1,000 students, by definition, cannot exist in districts with fewer than 1,000 students.) The relationships between school size and student/teacher ratios are discussed later in this chapter.

Table 5.3— Student/teacher ratios of regular districts, by district size: 1986-87 to 1990-91

	Number of Teachers in Analysis	Student/Teacher Ratio
Overall		
1986-87	2,201,351	18.0
1987-88	2,246,968	17.6
1988-89	2,264,280	17.6
1989-90	2,317,646	17.4
1990-91	2,362,257	17.3
Size		
0 - 999		
1986-87	199,545	14.8
1987-88	201,978	14.5
1988-89	200,108	14.7
1989-90	203,957	14.3
1990-91	204,232	14.2
1,000 - 4,999		
1986-87	721,176	17.4
1987-88	730,547	17.1
1988-89	732,216	16.9
1989-90	745,076	16.8
1990-91	746,927	16.8
5,000 - 9,999		
1986-87	365,093	17.8
1987-88	361,380	17.7
1988-89	363,417	18.4
1989-90	372,120	17.4
1990-91	365,617	17.6
10,000 and over		
1986-87	919,716	19.1
1987-88	970,576	18.6
1988-89	948,574	18.7
1989-90	1,002,995	18.3
1990-91	1,038,979	18.3

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

SES (poverty rates). In the period examined, districts with the lowest poverty rates (i.e., fewer than 5 percent of children in poverty) had about one fewer student per teacher than other districts. However, student/teacher ratios in the poorest districts (i.e., 25 percent or more children in poverty) were nearly indistinguishable from those in districts with poverty rates between 5 and 25 percent. Differences between these three types of districts never exceeded 0.3 students per teacher and were usually within ± 0.2 students per teacher (see table 5.4).

Table 5.4— Student/teacher ratios of regular districts, by SES (percentage of population in poverty): 1986-87 to 1990-91[a]

	Number of Teachers in Analysis	Student/Teacher Ratio
Overall		
1986-87	2,201,351	18.0
1987-88	2,237,744	17.6
1988-89	2,261,721	17.6
1989-90	2,317,646	17.4
1990-91	2,360,796	17.3
Percentage of school-age children in poverty: 1990		
< 5%		
1986-87	249,075	16.9
1987-88	255,468	16.5
1988-89	259,686	16.5
1989-90	264,584	16.4
1990-91	270,570	16.4
5% - < 15%		
1986-87	753,167	18.1
1987-88	764,175	17.8
1988-89	772,646	17.7
1989-90	791,860	17.7
1990-91	811,517	17.6
15% - < 25%		
1986-87	605,564	18.0
1987-88	613,894	17.7
1988-89	619,485	17.7
1989-90	641,132	17.4
1990-91	650,759	17.4
25% and over		
1986-87	593,545	18.3
1987-88	604,207	17.9
1988-89	609,905	17.7
1989-90	620,070	17.4
1990-91	627,950	17.3

[a] Only districts for which SES data were available are included in these analyses.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91; U.S. Department of Education, National Center for Education Statistics, School District Data Book Version 1.0, June 1994.

Racial-ethnic composition. Throughout the period examined, a strong relationship was found between student/teacher ratios and a district's racial-ethnic composition. The greater the proportion of minority students in a district, the higher the student/teacher ratio (see table 5.5). High minority districts averaged about 1.5 more students per teacher than low minority districts.

Table 5.5— Student/teacher ratios of regular districts, by racial-ethnic composition: 1987-88 to 1990-91[a]

	Number of Teachers in Analysis	Student/Teacher Ratio
Overall		
1987-88	2,245,751	17.7
1988-89	2,263,145	17.6
1989-90	2,316,537	17.4
1990-91	2,361,385	17.3
Percent minority		
< 5%		
1987-88	541,754	16.7
1988-89	514,176	16.7
1989-90	535,803	16.5
1990-91	551,447	16.3
5% - < 20%		
1987-88	605,820	17.5
1988-89	617,371	17.4
1989-90	612,761	17.3
1990-91	595,077	17.2
20% - < 50%		
1987-88	552,055	17.8
1988-89	568,510	17.8
1989-90	585,792	17.6
1990-91	606,177	17.6
50% and over		
1987-88	546,122	18.5
1988-89	563,088	18.4
1989-90	582,181	18.1
1990-91	608,683	18.0

[a] Only districts with nonzero students counts are included in these analyses.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

Type of school. As noted in chapter 2 of this report, the number of special education students in regular school districts increased from 1987-88 to 1990-91 by 1,387,622 (about 56 percent). During this time period, the number of students enrolled in special education schools remained relatively constant, increasing by only 12,591 (about 8 percent). This finding suggests that school districts are following a policy of placing special education students in the least restrictive environment (mainstreaming) to the greatest extent possible. Those students not mainstreamed (i.e., those being educated in schools that only serve special education students) should comprise a population in need of more intensive services. Therefore, it is not surprising that student/teacher ratios were lowest in special education schools from 1986-87 to 1990-91 (see table 5.6).

Table 5.6— Student/teacher ratios of different schools, by type: 1986-87 to 1990-91[a]

	Number of Teachers in Analysis	Student/Teacher Ratio
Overall		
1986-87	2,200,958	17.9
1987-88	2,245,966	17.7
1988-89	2,263,280	17.6
1989-90	2,316,670	17.4
1990-91	2,361,840	17.3
Type		
Regular school		
1986-87	2,149,504	18.1
1987-88	2,198,670	17.9
1988-89	2,217,827	17.8
1989-90	2,265,762	17.6
1990-91	2,312,326	17.5
Special education school		
1986-87	25,193	8.6
1987-88	22,951	6.5
1988-89	22,500	6.9
1989-90	22,871	6.6
1990-91	24,444	6.6
Vocational education school		
1986-87	20,312	9.5
1987-88	16,772	7.3
1988-89	16,463	7.4
1989-90	17,744	7.4
1990-91	16,044	6.9
Alternative education school		
1986-87	5,949	10.1
1987-88	7,573	12.5
1988-89	6,490	10.4
1989-90	10,293	12.8
1990-91	9,026	11.7

[a] Schools for which "school type" was missing are not included in this analysis.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

During the time period studied, student/teacher ratios in vocational education schools were lower than those in regular schools. Vocational education schools are typically high schools, which have lower student/teacher ratios than the regular schools overall. When compared with high schools, however, the average student/teacher ratio in vocational education schools was much lower. This finding suggests the possibility of smaller classes and/or proportionally more teachers at vocational high schools. The number of students enrolled in vocational high schools decreased by 42 percent from 1986-87 to 1990-91, while the number of teachers declined by 21 percent. Some of these declines may reflect the growth of magnet schools and a tendency to label vocationally oriented magnet schools as "regular" rather than "vocational education" schools.

From 1986-87 to 1990-91, the number of students enrolled in alternative education schools increased by 77 percent, and the number of teachers increased by 52 percent. Growth was quite erratic; student/teacher ratios in these schools also changed erratically over time. Some of this growth may reflect arbitrariness in classifying schools and the apparent practice of reclassifying a school from year to year as its education focus changes.[39]

School characteristics. Student/teacher ratios are influenced by school characteristics. One of the most important of these is the grade levels served. In 1987-88, the student/teacher ratio for elementary schools in regular school districts was 18.9; for secondary (high) schools, 17.1.[40] In order to investigate how student/teacher ratios vary as a function of school characteristics (other than grade levels served), only schools serving a particular grade range (secondary schools) were analyzed to avoid the confound of grade level. Secondary schools, rather than elementary schools were selected because of the greater homogeneity of grade levels served.

School locale. The CCD classifies the locale of a school relative to populous areas according to a hierarchy of seven locale codes. (The definitions of these locale codes are provided in Appendix A—Definitions of Key Terms.) Within a district classified as urban/central city, there can be different types of school locales. To investigate further the relationships between student/teacher ratios and locale, analyses by school locale were performed.

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[39] As previously noted, of the 866 schools classified as alternative education schools in 1987-88, only 521 (60 percent) were alternative education schools in each of the next 3 years; 158 (18 percent) closed down; and the remainder (187, or 22 percent) changed their status at least once or disappeared for at least 1 year before reappearing in 1990-91.

[40] In high schools, student/teacher ratios are *not* the same as class size. In a secondary school with an eight-period class day, the typical teacher may have instructional responsibilities for five periods while the typical student might take six or seven classes. As a result (especially when physical education classes are included), the average class size in a high school can be much higher than the school's student/teacher ratio.

High schools in large cities had the highest student/teacher ratios; those in rural areas, the lowest (see table 5.7). From 1986-87 to 1990-91, these ratios consistently declined in high schools in every locale.[41] This trend leveled off by 1989-90; changes between 1989-90 and 1990-91 were slight in all locales.

School size. There are very strong relationships between high school size and student/teacher ratios: The larger the high school, the higher the student/teacher ratio (see table 5.8). By 1990-91, the student/teacher ratio in the smallest high schools was less than two-thirds (62 percent) of the student/teacher ratio in the largest high schools.

The student/teacher ratios declined from 1986-87 to 1990-91 in high schools of all sizes. The smallest high schools showed a marked decline in both student/teacher ratios and teachers from 1986-87 to 1987-88. This decline was due to the closing of 150 high schools and the grade-level restructuring of 212 other high schools.[42] After 1987-88, student/teacher ratios remained relatively constant in the smallest high schools, while student/teacher ratios in high schools of all other sizes decreased by at least 0.5 students per teacher.

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[41] There was one exception to this pattern: a slight (0.1) increase in student/teacher ratio in urban fringe high schools between 1989-90 and 1990-91.

[42] Of the 212 high schools that restructured, 133 were in a single state. These high schools all became "combination" schools, serving students at lower grade levels than they previously served.

Table 5.7— Student/teacher ratios of regular high schools, by locale: 1986-87 to 1990-91

	Number of Teachers in Analysis	Student/Teacher Ratio
Overall		
1986-87	657,186	17.6
1987-88	661,273	17.1
1988-89	653,795	16.8
1989-90	655,641	16.4
1990-91	652,316	16.4
Locale		
Large city		
1986-87	69,939	19.5
1987-88	70,617	19.0
1988-89	69,878	18.6
1989-90	69,539	18.1
1990-91	70,418	18.1
Mid-size city		
1986-87	94,269	18.8
1987-88	95,850	18.3
1988-89	95,453	18.0
1989-90	93,771	17.6
1990-91	94,272	17.4
Urban fringe of large city		
1986-87	115,144	18.4
1987-88	113,878	17.8
1988-89	111,733	17.5
1989-90	112,600	17.2
1990-91	111,959	17.2
Urban fringe of mid-size city		
1986-87	77,539	17.8
1987-88	79,028	17.4
1988-89	78,306	17.1
1989-90	77,239	16.7
1990-91	77,029	16.8
Large town		
1986-87	14,867	18.3
1987-88	14,950	17.7
1988-89	14,521	17.3
1989-90	14,361	17.0
1990-91	14,148	16.9
Small town		
1986-87	157,786	17.1
1987-88	159,773	16.8
1988-89	158,331	16.4
1989-90	158,929	15.9
1990-91	157,297	15.9
Rural		
1986-87	127,642	15.2
1987-88	127,177	14.9
1988-89	125,573	14.7
1989-90	129,202	14.3
1990-91	127,193	14.3

NOTE: 1990-91 rows use 1989-90 locale classifications.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

Table 5.8— Student/teacher ratios of regular high schools, by school size: 1986-87 to 1990-91

	Number of High School Teachers in Analysis	Student/Teacher Ratio
Overall		
1986-87	657,186	17.6
1987-88	661,273	17.1
1988-89	653,795	16.8
1989-90	655,641	16.4
1990-91	652,316	16.4
Size		
0 - 249		
1986-87	61,884	12.8
1987-88	45,516	11.3
1988-89	45,502	11.4
1989-90	47,157	11.0
1990-91	46,782	11.1
250 - 499		
1986-87	68,852	15.5
1987-88	72,513	15.0
1988-89	74,797	14.8
1989-90	79,792	14.4
1990-91	78,476	14.5
500 - 999		
1986-87	155,282	16.9
1987-88	164,281	16.4
1988-89	169,505	16.0
1989-90	174,979	15.7
1990-91	176,213	15.6
1,000 and over		
1986-87	371,168	19.0
1987-88	378,963	18.6
1988-89	363,990	18.3
1989-90	353,713	17.9
1990-91	350,845	18.0

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

Multivariate analyses (general linear models) were used to identify the types of districts and high schools in which the greatest changes in student/teacher ratios occurred and to determine the relative importance of specific district and school characteristics on these ratios. These analyses hold other analytic factors (e.g., district size, SES) constant and calculate the variation in student/teacher ratios that is due to only one factor (e.g., urbanicity). By controlling for all other characteristics, it is possible to assess the impact of the characteristic of interest in schools that are alike on other factors.

The following tables present "Equated Mean Ratio" and "Equated Mean Change." "Equated Mean Ratio" indicates what the student/teacher ratio of a district (or high school) with a particular attribute (e.g., enrollment of 1,000 - 4,999) would be if the district (or high school) were "average" on all other characteristics in 1987-88. "Equated Mean Change" shows what the average change in the weighted student/teacher ratio would be in this type of district (or school) if the district (or school) were "average" on all other characteristics.

District characteristics. From 1987-88 to 1990-91, the district characteristic most strongly related to student/teacher ratios was district size: Student/teacher ratios were greater in large districts (see table 5.9). This relationship held whether or not controlling for other characteristics. The differences between districts with respect to this ratio diminished over this time period; in other words, the largest districts had the largest declines in student/teacher ratios. Nonetheless, the 1990-91 student/teacher ratio in the smallest districts was still much lower than in the largest districts.

Although the largest student/teacher ratios were found in urban districts, controlling for district size and other factors reversed the relationship between student/teacher ratios and metropolitan status. If urban, suburban, and rural districts were all of the same size, had similar minority composition, and were of similar SES, student/teacher ratios would be highest in rural districts and lowest in urban districts. By itself, metropolitan status is a relatively poor predictor of student/teacher ratios.

When controlling for other factors, minority composition had an impact only in the predominantly (at least 50 percent) minority districts. After controlling for all other factors (size, metropolitan status, and SES), the student/teacher ratio in predominantly minority districts (in 1987-88) was at least 0.8 students per teacher higher than it was in districts of any other racial-ethnic composition.

Table 5.9— Changes in student/teacher ratios in districts with different characteristics: 1987-88 to 1990-91[a]

	Number of Teachers in Analysis	Student/Teacher Ratio (1987-88)	Mean Change to 1990-91	Equated Mean Ratio (1987-88)	Equated Mean Change to 1990-91
Overall	2,233,018	17.7	-0.4	(†)	(†)
Size (1987)					
0 - 999	196,640	14.6	0.0	14.5	0.0
1,000 - 4,999	722,683	17.1	-0.3	17.0	-0.3
5,000 - 9,999	364,491	17.8	-0.4	17.8	-0.4
10,000 and over	948,574	18.7	-0.5	18.8	-0.5
Metropolitan status (1987)					
Urban/central cities	592,869	18.3	-0.5	17.0	-0.3
Suburban/metropolitan	1,035,044	17.8	-0.3	18.0	-0.3
Rural	605,105	16.8	-0.4	17.7	-0.5
Percent minority (1987)					
< 5%	536,086	16.7	-0.3	17.4	-0.4
5% - < 20%	602,073	17.5	-0.2	17.5	-0.3
20% - < 50%	551,354	17.8	-0.4	17.4	-0.3
50% and over	543,505	18.6	-0.6	18.3	-0.4
SES (% of school-age children in poverty: 1990)					
0% - < 5%	254,609	16.5	-0.2	16.6	-0.2
5% - < 15%	761,847	17.8	-0.2	17.9	-0.2
15% - < 25%	613,230	17.7	-0.4	17.8	-0.4
25% and over	603,332	17.9	-0.6	17.6	-0.6

[a] Only districts for which SES data were available are included in these analyses.

NOTE: Numbers in this table are not directly comparable with numbers presented earlier in this chapter because:

(1) Data are provided only for districts that were in existence both in 1987-88 and 1990-91, and

(2) Change data are weighted by the district's 1987-88 enrollment.

(†) Values for *Overall* "Equated Mean Ratio (1987-88)" and "Equated Mean Change to 1990-91" are omitted because they are the same as the simple means, by definition.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91; U.S. Department of Education, National Center for Education Statistics, School District Data Book Version 1.0, June 1994.

SES, after controlling for other factors, had its greatest impact on 1987-88 student/teacher ratios in the most affluent districts. These districts had at least one student per teacher less than any of the less affluent districts. This finding is consistent with affluent districts' ability to spend more on their schools by providing more teachers for their students.

School characteristics. From 1987-88 to 1990-91, school size was found to be strongly associated with student/teacher ratios (see table 5.10). Controlling for nonsize characteristics made this relationship even more robust. When controlling for other factors, the difference in student/teacher ratios between the smallest and largest schools increased from 6.2 students per teacher (18.9 - 13.7) to 7.3 students per teacher (20.6 - 13.3). However, from 1987-88 to 1990-91, these ratios improved (i.e., decreased) for large schools (controlling for all other characteristics).

In 1987-88, student/teacher ratios were highest in elementary schools. Unadjusted ratios in middle and secondary schools were quite similar.[43] The higher student/teacher ratios in elementary schools run counter to the findings that (a) elementary schools tend to be smaller than other schools and (b) smaller schools tend to have lower student/teacher ratios. When size and other school characteristics were controlled for, the differences between elementary and both middle and secondary schools were accentuated. Clearly, comparisons of student/teacher ratios for policy purposes must be carried out separately for elementary and for other schools.

School specialization had a strong influence on student/teacher ratios during this time period, with student/teacher ratios lowest in specialized schools and highest in regular schools. Many of these specialized schools are smaller than the typical regular school; many vocational and alternative education schools are also secondary schools. Since the smaller schools and nonelementary schools had lower student/teacher ratios, analytically controlling for an association with these factors would result in increases in equated student/teacher ratios in specialized schools. All of the equated mean ratios for specialized schools were increased, suggesting the importance of these other factors in the determination of student/teacher ratios in specialized schools.

When controlling for other school characteristics, student/teacher ratios declined substantially (27 percent) for vocational education schools from 1987-88 to 1990-91. Some of this decline may reflect artifacts associated with the classification of vocational education schools.[44] It should also be noted that the number of teachers in vocational education schools is a negligible proportion (1/239) of the number in regular schools. Small changes in the numbers of enrolled students in these schools will have much greater impacts on student/teacher ratios than similar enrollment changes in regular schools. Student/teacher ratios (and changes in these ratios from 1987-88 to 1990-91) were independent of a school's locale. When all other factors were controlled for, locale had scant influence on a school's student/teacher ratio.

The apparent relationship between minority composition and student/teacher ratios in 1987-88, with ratios increasing as school minority composition increases, was substantially reduced but not eliminated when other school characteristics were controlled. The difference between schools with the highest and lowest percent minority composition was reduced by more than half (from 18.4 - 17.0 = 1.4 to 18.0 - 17.4 = 0.6).

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[43] Although nonequated ratios were lowest in "Not classifiable" schools and equated ratios were highest in these schools, no generalizations will be made about these "not classifiable" schools.

[44] The vocational education schools included in this analysis were schools in existence in both 1987-88 and 1990-91. Five percent of these schools became special education schools (with characteristically low student/teacher ratios), 3 percent became alternative education schools, and 4 percent became regular schools (both of which have characteristically higher student/teacher ratios).

Table 5.10— Changes in student/teacher ratios in schools with different characteristics: 1987-88 to 1990-91

	Number of Teachers in Analysis	Student/Teacher Ratio (1987-88)	Mean Change	Equated Mean Ratio (1987-88)	Equated Mean Change
Overall	2,175,286	17.8	-0.4	(†)	(†)
Size (1987)					
0 - 249	186,821	13.7	0.4	13.3	0.1
250 - 499	608,165	17.2	-0.1	16.2	-0.2
500 - 999	874,721	18.4	-0.5	18.2	-0.5
1,000 and over	505,579	18.9	-0.7	20.6	-0.5
Locale (1987)					
Large city	281,987	18.7	-0.5	17.9	-0.3
Mid-size city	359,206	18.3	-0.5	17.9	-0.4
Urban fringe of large city	361,419	18.1	-0.2	17.7	-0.2
Urban fringe of mid-size city	260,014	17.9	-0.3	17.5	-0.2
Large town	52,015	18.1	-0.6	17.9	-0.5
Small town	482,618	17.5	-0.3	17.8	-0.3
Rural	378,027	16.6	-0.3	17.8	-0.4
Type (1987)					
Regular	2,141,539	17.9	-0.4	17.9	-0.3
Special education	19,182	6.7	0.2	9.8	-0.6
Vocational education	8,963	13.0	-1.9	14.3	-3.8
Alternative education	5,602	15.5	0.5	18.2	0.6
Grade range (1987)					
Elementary	958,976	18.9	-0.3	19.8	-0.5
Middle	382,005	16.8	0.2	16.3	0.0
Secondary	660,605	17.1	-0.6	15.7	-0.5
Combined	161,719	17.2	-0.6	18.0	-0.7
Not classifiable	11,981	6.2	0.4	14.7	-0.3
Percent minority (1987)					
< 5%	580,432	17.0	-0.3	17.4	-0.4
5% - < 20%	573,814	17.8	-0.3	17.8	-0.3
20% - < 50%	500,660	18.1	-0.4	17.9	-0.4
50% and over	520,380	18.4	-0.4	18.0	-0.3

NOTE: Numbers in this table are not directly comparable with numbers presented earlier in this chapter because:

(1) Data are provided only for schools that were in existence both in 1987-88 and 1990-91, and

(2) Change data are weighted by the school's 1987-88 enrollment.

(†) Values for *Overall* "Equated Mean Ratio (1987-88)" and "Equated Mean Change" are omitted because they are the same as the simple means, by definition.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 to 1990-91.

Questions for Further Research

Average student/teacher ratios have declined from 1986-87 to 1990-91 by about 1 student per teacher. Although at the individual classroom level, a decline in ratios from 18 to 17 may not seem that profound, a decline of this magnitude implies that each student can receive about 5 percent more attention from a teacher. Student/teacher ratios are believed to be a good proxy for class size measures. So, this decline in student/teacher ratios is consistent with the promulgation of state and district policies to decrease class size. The impact of these declines on education processes and outcomes is beyond the scope of the CCD Surveys. Other sources of data must be created and analyzed to allow the following questions to be addressed:

> *What association exists between the changes in student/teacher ratios and student achievement? teacher satisfaction? teacher attrition?*
>
> *Is there an "optimal" student/teacher ratio for each of these outcomes?*

Not all states and districts have implemented or changed student/teacher ratio policies over the 1986-87 to 1990-91 period. The existence of increases in the number of education agencies with policies encouraging lower student/teacher ratios and of a general decline in these ratios does not mean that a causal relationship exists. Declines could occur in states and districts for other reasons. Further information is needed to determine the following:

> *What specific policies and practices are associated with declines in student/teacher ratios?*

Coincident with this decline in student/teacher ratios has been an increase in the number of special education students. Special education students who are mainstreamed receive services from both regular and special education teachers, and special education students not mainstreamed are typically in smaller classes than regular education students. Associations between student/teacher ratios could be investigated separately for regular and special education teachers, allowing the following questions to be addressed:

> *How do special education student/special education teacher ratios compare to regular education student/teacher ratios?*
>
> *How have these ratios changed over time? Specifically, has the regular education student/teacher ratio changed?*
>
> *What associations exist between these ratios and district characteristics? school characteristics?*

Finally, student/teacher ratios are slightly different from class size. For example, it is possible for schools to have specialized teachers or for teachers to teach in teams. These would lower the student/teacher ratio without changing class size. Nonetheless, one would generally expect changes in class size to parallel changes in student/teacher ratios. Inconsistencies would merit further investigation.

How have class sizes changed over time?

How have these changes varied as a function of district and school characteristics?

How do these changes compare with changes in student/teacher ratios? If there are differences, why is this happening?

Student/teacher ratios are lowest in the smallest districts, the most affluent districts, in special education schools, and in high schools (as opposed to elementary schools). They are also related to the proportion of minority students in a district, even controlling for other district characteristics. This finding suggests another question:

Why do schools with the highest concentrations of minority students have higher student/teacher ratios?

6 Recommendations for Use and Users of CCD Data

Overview

The data summarized in this report represent the first major attempt to conduct longitudinal analyses of Common Core of Data Surveys information. These data provide a clear picture of changes in the demographics of school districts from 1987-88 to 1990-91 and how these districts and their component schools responded to these changes. They also provide baselines for the assessment of subsequent change.

Since CCD data had not been used in this fashion before, a thorough review of the processes involved in their production and of the nature and structure of the data comprising the CCD data files was undertaken prior to the conduct of analyses. This effort also involved some of the first efforts to link 1990 Census data (from the School District Data Book, Version 1.0) with CCD data and use these Census data to enhance the value of information contained in the CCD.

Insights gained as a result should prove beneficial to others who are taking advantage of the extraordinary wealth of data contained in the CCD data files. They are summarized in this final chapter.

CCD Data Collection Operations

CCD data are voluntarily provided by state education agencies through their CCD Coordinator. This individual, appointed by the chief state school officer, is responsible for overseeing the completion of the State Nonfiscal Survey, the Public Elementary/Secondary Education Agency Universe ("District") Survey, and the Public Elementary/Secondary School Universe ("School") Survey and for verifying their accuracy.

In order for data to be comparable across states, standard definitions must be employed when reporting on schools, staff, and students. Critical definitions for all survey items are provided to CCD Coordinators, as well as general instructions for completion of the surveys. In addition, data conferences and training sessions are held on at least a yearly basis.

To facilitate the provision of data, general information for each district and school (name, address, phone number, metropolitan status or urbanicity code, and type of school/district) from the previous year's data collection is provided. Coordinators only have to note any changes in these elements. As a result of this practice, the (valid) perception that these characteristics are not expected to change frequently is created. For example, as long as a school remains at its old address—or remains in the same community, its locale code would generally not be expected to change. As a result, a minor change in local or statewide reporting practices can have a profound effect on the distribution of values for this variable in the CCD. Explicit instructions by two or three state CCD Coordinators that schools review *all* of their general information can have a large impact on the reliability and validity of these variables. In 1990-91, a significant proportion (7 percent) of the school locale codes changed from the previous year. In two states, over 90 percent of the schools were assigned locale codes different from the previous year's; in a third state, one-third (34 percent) of the schools were assigned different locale codes. Although this practice undoubtedly provided a better indication of school locale, caution is necessary when using this variable to look at trends over time. These changes, generally rare in other years, were episodic and highly clustered by state and year.

Student and staffing counts are not preprinted on the CCD district and school data collection instruments. Generation of these counts are typically one of the functions of a state's record-keeping system. As state data collection systems are restructured, generation of specific data requested by the CCD surveys can become one of the objectives of the new system. Restructuring of data collection systems can produce data which are more valid—but it can make them less comparable with those previously provided and compromise simple trend analysis.

Interpretation of Change Data

Sudden and unexpected changes in the reporting of characteristics can be associated with systemic changes. When an unexpected change is noted, efforts should be made to determine whether this change is idiosyncratic to one or only a few agencies, and to determine whether it is part of a multiyear trend. If idiosyncratic and episodic, and especially if this change is associated with the earlier years of CCD data collection, caution in interpreting the finding is appropriate.

Data Quality

One indicator of data quality is the amount of missing data. High levels of missing data for any variable are a source of concern, preventing the simple generation of national estimates. If nonresponse were random, this would not be a major concern. Due to its data collection practices, nonresponse patterns for CCD data are generally clustered and associated with a few nonreporting agencies (see Table B.2).

As new items were added to the CCD, many agencies initially found it difficult or impossible to provide the requested information. However, with the knowledge that such data would be requested on a regular basis, procedures to allow the generation of this information evolved. The proportion of schools providing racial-ethnic breakdowns for all of their students, not requested in 1986-87, increased from 63 percent in 1987-88 to 89 percent in 1990-91. Similarly, in 1986-87, 80 percent of the districts were able to provide student enrollments. By 1991-92, the proportion of districts providing these data increased to nearly all (99.92 percent).[45]

In general, within most states, most districts, and most schools, most CCD data can be used in a simple and direct fashion to assess changes over time. However, because of this clustered nonresponse, CCD data for the 1987-88 to 1990-91 period should not be used to evaluate national trends for certain school and district characteristics (such as racial composition) unless one is willing to impute missing data, using a sophisticated imputation methodology.

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[45] 1991-92 is used as a reference point rather than 1990-91 because missing values on the district survey were recoded to zeroes in 1990-91. For items with high nonresponse in 1990-91, simple means will substantially underestimate the true value. Zeroes were treated as missing for 1990-91 in the report and imputed from related variables.

Response rates for most CCD variables were excellent throughout the 1986-87 to 1991-92 period. However, items dealing with the numbers of different types of school completers proved to be particularly problematic. The numbers of "other" diploma recipients were provided by barely half (51.5 percent) of the districts in 1987-88 and 58 percent of the districts in 1991-92. For "other" high school completers, the item response rates were even lower: 50 percent in 1987-88 and 49 percent in 1991-92. Interpretation of results on these variables should be extremely limited, even if sophisticated imputation procedures are employed.

Decisions about whether 1986-87 to 1990-91 CCD data are adequate to support planned analyses are critically dependent on which data are to be used and how they are to be used. Simple checks of nonresponse prevalence and patterns will inform analysts about the feasibility of their planned approaches and of the potential need for procedures to handle issues relating to item nonresponse.

With these simple precautions, CCD data provide insights and depths of understanding about the nation's public school system that are not otherwise possible.

Study Results

Data from the CCD Surveys were organized to describe how school districts and schools changed during the 1986-87 to 1990-91 period. The period from 1986 through 1991 was an unusual one for American public school systems because it saw both decreasing high school enrollments, as the small birth cohorts from the mid-1970s moved through the schools, and increasing elementary school enrollments. Thus, many school districts were dealing simultaneously with growing enrollments in some schools and declining enrollments in others. The potential policy effects of these imbalances may be both subtle and far-reaching. For example, they may have provided additional impetus for the move from junior high schools (serving grades 7-9) to middle schools (serving grades 6-8) that occurred in many districts throughout the nation.

Critical district attributes (size, metropolitan status, SES, and percent minority students) and school attributes (size, locale, type, grade range, and percent minority students) were used for classification and comparison purposes. These enabled identification of the types of districts and schools that had changed the most with respect to basic characteristics (such as racial composition) and performance indicators (such as student/teacher ratios). District and school attributes associated with these basic characteristics and indicators were also identified.

Since the district attributes used for classification purposes were not independent of each other, multivariate analysis techniques were employed to disentangle their interrelationships. These techniques created "virtual" districts and schools that could be compared, allowing the effects of specific attributes to be determined. In this fashion, associations of variations in enrollment size, racial-ethnic composition, grade levels served, racial balance, and student/teacher ratios with individual school and district attributes were investigated.

For example, with respect to SES, a variable developed through linkages to the School District Data Book, 1987-88 to 1990-91 CCD data were able to demonstrate compelling relationships between district affluence and

- Racial imbalance between schools in the district. The poorest districts were the most imbalanced.

- Prevalence of middle schools. The higher the SES, the greater was the proportion of seventh graders enrolled in middle schools.

Most importantly, it showed that the strong relation between a district's minority composition and its SES has continued to 1990. The poorest districts, even after controlling for other district attributes, still had nearly five times the proportion of minority students as the most affluent districts.

Other findings, summarized in the Executive Summary, demonstrate the feasibility of using CCD data to assess national trends and to draw inferences about relationships between school and district attributes and characteristics and outcomes of interest to policymakers, education practitioners, and researchers.

Potential Uses of CCD Data

The ease of linking CCD data with other data sets makes the CCD an exceedingly valuable resource. In this project, CCD school district ID numbers enabled linkage of information about the district's SES (assessed as the percentage of the district's school-age children living in households below the poverty level) was extracted from 1990 Census data contained in NCES's School District Data Book, Version 1.0, June 1994. This information was used for the classification of school districts, enabling demonstrations of relationships of several critical measures and outcomes with district affluence.

There are literally hundreds of different Census variables available for linkage. These include information about the district's racial-ethnic composition (including highly detailed categorizations of race), at-risk school-age children, education attainment, language spoken at home and linguistic isolation, family income, households receiving public assistance, and place of birth. The relationships between attributes such as these and the district's school system can be easily investigated. For example, the proportion of school-age children attending public school can be estimated.

Historical records. The presence of a constant and invariant identifier of schools and districts enables the assessment of within-school and within-district change. This provides an opportunity to use the CCD as a source of historical information about the schools or agencies being studied and to link this information with other data files. In addition to current data about the school or agency, the researcher can employ information about how the school or district has changed over time as analytic variables. For example, knowledge that a school's enrollment has doubled over the past 2 years may provide critical insights.

In addition, the types of schools (or districts) that have changed the most with respect to any measured characteristic (such as proportion of Hispanic students) can be identified; reasons for these changes can be independently investigated. In like fashion, the impacts of state and local education policies and practices can be assessed through assessment of changes in school and district characteristics. For example, the association between district racial imbalance and SES can stimulate one to identify districts (and states) in which this relationship runs counter to the norm—that is, to identify low SES districts that are racially balanced. Or, districts that have shown substantial improvement in their racial balance or interracial exposure indices can be identified. These districts can be investigated to identify the policies and practices they employed.

Conclusion

It is hoped that the findings presented in this report will encourage others to pursue further investigations. The CCD is an excellent source of data to demonstrate relationships between different school, district, and state characteristics. It also provides a historical record of the school(s) or agency(ies) of interest. This information can assist in conducting investigations of how and why education in America is changing. Investigations of why relationships exist become more feasible when one can identify the type(s) of schools, districts, and states in which these relationships are strongest and weakest, and where the greatest changes are occurring.

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Appendix A

Definitions of Key Terms

Definitions of Key Terms

An **alternative education school** is a public school that:

- addresses needs of students which typically cannot be met in a regular school;
- provides nontraditional education;
- may be an adjunct to a regular school; and
- does not specifically fall into the categories of regular, special education, or vocational education.

A **central city** is defined as a city within a Metropolitan Statistical Area (MSA) with a minimum population of 50,000 and has a Census Urbanized Area Code.

A **combined** school is defined as a public school serving students in grades characteristic of both elementary, middle, and/or high school. The specific grades served are indicated in *Table 1. Schema for Classification of Schools by Grades Served.* (See **grade range**.)

A **Consolidated Metropolitan Statistical Area (CMSA)** is defined as an area of greater than 1,000,000 population, totality of the PMSAs in a single geographical area.

An **education agency** is defined as a government agency administratively responsible for providing public elementary and/or secondary instruction or education support services.

An **elementary** school is defined as a public school serving students in any grades from prekindergarten through grade 6.

Enrollment is defined as the count of students on the current roll taken as of the school day closest to October 1.

A **Federally operated agency** is defined as any elementary, secondary, or combined education program operated by a federal agency (such as Bureau of Indian Affairs).

A school's **grade range** was classified according to the following categories:

a) Elementary school
b) Separate middle grade school[1]
c) High school
d) Combination school[1]
e) Ungraded

Table 1 provides the decision rules used in classifying schools.

A **high** school is defined as a public school whose lowest grade is 6 or higher and whose highest grade is 10 or higher. The specific grades served are indicated in *Table 1. Schema for Classification of Schools by Grades Served.* (See **grade range**.)

Individualized Educational Plan (IEP), as used here, is defined as a written instructional plan for students with disabilities designated as special education students under IDEA-Part B. This includes:

- statement of present levels of education performance of a child;
- statement of annual goals, including short-term instructional objectives;
- statement of specific education services to be provided and the extent to which the child will be able to participate in regular education programs;
- projected date for initiation and anticipated duration of services;
- appropriate objectives, criteria and evaluation procedures; and
- schedules for determining, on at least an annual bases, whether instructional objectives are being achieved.

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[1] The criteria for classifying schools (serving third graders and seventh, eighth, or ninth graders) was based on contacting a random sample of nine such schools and asking:

> (1) What type of school do you consider yourself to —an elementary school, a middle school, a high school, or a combination of these schools?
>
> (2) Do students in some grades have different teachers for different subjects, or do they all have the same teacher for all subjects?

In eight of these nine schools, the classic elementary school structure (i.e., one teacher for a class) typified some, but not all, grades. Accordingly, these schools were classified as combined schools. It was also noted that many of the schools with the word "Elementary" in their name had different teachers for different subjects for their upper grade students.

Table 1. Schema for classification of schools by grades served

	Highest Grade													
Lowest Grade	PK	K	1	2	3	4	5	6	7	8	9	10	11	12
PK	E	E	E	E	E	E	E	E	C	C	C	C	C	C
K		E	E	E	E	E	E	E	C	C	C	C	C	C
1			E	E	E	E	E	E	C	C	C	C	C	C
2				E	E	E	E	E	C	C	C	C	C	C
3					E	E	E	E	C	C	C	C	C	C
4						E	E	E	M	M	M	C	C	C
5							E	E	M	M	M	C	C	C
6								E	M	M	M	H	H	H
7									M	M	M	H	H	H
8										M	M	H	H	H
9											M	H	H	H
10												H	H	H
11													H	H
12														H

NOTE: E=Elementary; M=Middle; H=High; C=Combined. Low grades are on the diagonal; high grades are listed on top.

District metropolitan status is defined as the classification of an education agency's service area relative to a Metropolitan Statistical Area.

Categories and distinctions are:

- urban/central city—primarily inside a central city,
- suburban/metropolitan—primarily outside a central city,
- rural—nonurban area.

Locale (school), as used here, is a way to classify the location of a school relative to populous areas. The locale code options are:

- Large city—Central city of an SMSA with a population greater than or equal to 400,000 or a population density greater than or equal to 6,000 people per square mile.
- Mid-size City—Central City of an SMSA with a population less than 400,000 and a population density less than 6,000 people per square mile.
- Urban Fringe of Large City—Place within an SMSA of a Large Central City and defined as urban by the Census Bureau.
- Urban Fringe of Mid-size City—Place within an SMSA of a Mid-size Central City and defined as urban by the Census Bureau.
- Large Town—Town not within an SMSA, with a population greater than or equal to 25,000.
- Small Town—Town not within an SMSA and with a population less than 25,000 and greater than or equal to 2,500.
- Rural—A place with less than 2,500 people and coded rural by the Census Bureau.

An area is defined as a **Metropolitan Statistical Area (MSA)** if it has a city of at least 50,000 population, or if it is an urbanized area of at least 50,000 with a total metropolitan population of at least 100,000.

A separate **middle grade** school is defined as a public school whose lowest grade is 4 or higher and whose highest grade is 7, 8, or 9. The specific grades served are indicated in *Table 1. Schema for Classification of Schools by Grades Served.* (See **grade range**.)

Minority enrollment refers to those students who are black, Hispanic, Asian, American Indian, and Alaska Native.

A **Non-MSA City** is a city or place not in an MSA with a minimum population of 25,000 inhabitants and a population density of at least 1,000 per square mile, and does not have a Census Urbanized Area Code.

Outside urbanized area is defined as an area not contiguous to any city or urban fringe area with a minimum population of 2,5000 inhabitants, an area with a population density of at least 1,000 per square mile, and without a Census Urbanized Area Code.

Other agency is defined as any elementary, secondary, or combined education program that cannot be appropriately classified using another CCD designation and that have been reported as such by the state's CCD Coordinator.

Population in poverty is defined as the number of school-aged children living in households below the poverty level in 1990.

A **Primary Metropolitan Statistical Area (PMSA)** is a component of a CMSA.

A **Public School** is defined as an institution that:

- provides education services;
- has one or more grade groups (PK-12); or
- is ungraded; and
- has one or more teachers to give instruction;
- is located in one or more buildings;
- has an assigned administrator;
- receives public funds as primary support; and
- is operated by an education agency.

The **Racial Imbalance** index is a measure which compares the racial composition of each school in a district to the district's overall racial composition. It represents the proportion of minority students who would have to be reassigned to other schools to bring about perfect racial balance in the district. This measure can range from 0 (perfect racial balance) to 1 (total segregation).

It was calculated by the following formula:

$$\mathit{Imbalance} = \frac{1}{2}\sum \left| \frac{W_i}{W} - \frac{M_i}{M} \right|$$

In the above equation, W_i is the number of members of the focal racial-ethnic group (e.g., white students) in the school; W is the number of focal racial-ethnic group members in the district; M_i is the number of all other students (e.g., minority students) in the school; and M is the number of all other students in the district.

The **(Inter)racial exposure** index is a measure of the amount of exposure the typical minority student has to white students. It was calculated by the following formula:

$$InterracialExposure = \frac{\sum_{k}^{s} N_{km} P_{kw}}{\sum_{k}^{s} N_{km}}$$

> In the above equation, k refers to each of s individual schools; N_{km} is the number (N) of minority group members in the school; and P_{kw} is the proportion of whites in the same school. These measures are added and then divided by the number of minority students in the district to provide an overall district measure.

Racial exposure indices, representing the proportion of white students in the typical minority student's school, are highly constrained by the proportion of white students in the district. If a district is perfectly racially balanced, the racial exposure index would be the proportion of white students in the district. If not perfectly balanced, it will be less. For this reason, the racial exposure index will be inversely related to the proportion of minority students in a district. Weighted racial exposure indices were determined by multiplying the racial exposure index by the number of minority students in the district. These indices were always lower than the simple district average. This reflects the fact that the districts with the lowest indices had the most minority students.

A **Regular school district** is defined as a local school district that is not a component of a supervisory union, or a local school district component of a supervisory union sharing a superintendent and administrative services with other local school districts.

It does *not* include supervisory union administrative centers or a county superintendent serving the same purposes; a regional education service agency or county superintendent serving the same purposes; State-operated or Federally-operated institutions charged at least in part with providing elementary and/or secondary instruction of services to special needs populations; or other education agencies that do not fit into any other category.

An area designated as **rural** is an area with 2,500 inhabitants or fewer and/or a population density of less than 1,000 per square mile and/or an area which does not have a Census Urbanized Area Code.

A **school district** is an education agency or administrative unit that operates under a public board of education.

School-age children in poverty is defined as children 5 years and over living in households whose poverty status was identified in 1990.

Secondary is defined as the general level of instruction classified by state and local practice as secondary and composed of any span of grades beginning with the next grade following the elementary grades and ending with or below grade 12.

Socioeconomic Status (SES) is a measure of affluence of the area served by the school district. The measure of affluence used as an indicator of SES in this report was the percentage of school-age children in poverty.

A **special education school** is a public school that primarily focuses on special education, including instruction for any of the following: hard of hearing, deaf, speech impaired, health impaired, orthopedically impaired, mentally retarded, seriously emotionally disturbed, multihandicapped, visually handicapped, deaf and blind, and has adapted curriculum, materials or instruction for students served.

A **State-operated agency** is defined as a state-operated agency charged, at least in part, with providing elementary and/or secondary instruction or support services.

A **student** is an individual for whom instruction is provided in an elementary or secondary education program that is not an adult education program and is under the jurisdiction of a school, school system, or other education institution.

A **Supervisory Union** is defined as an education agency where administrative services are performed for more than one school district by a common superintendent.

Student/teacher ratio is defined as the number of students in a district (or school) divided by the number of teachers in the district (or school).

A **Teacher** is defined as a professional staff member who instructs students and maintains daily attendance figures.

An **urbanized area** is defined as an area with a population concentration of at least 50,000 and generally consisting of a central city and the surrounding, closely settled, contiguous territory and with a population density of at least 1,000 per square mile.

A **vocational education school** is a public school that focuses primarily on vocational education and provides education and training in one or more semi-skilled or technical occupations.

Appendix B

Technical Notes on Data

- Data Sources
- Selection of Observations
- District Imputation Procedures
- School Data Imputation Procedures
- Data Cleaning
- Multivariate Analyses
- Tests of Statistical Significance
- Additional Analyses

Data Sources

Most of the information reported in these analyses was obtained from the Common Core of Data Surveys (School and Agency level files), as contained on the CD-ROM diskette, *National Center for Education Statistics Common Core of Data Disc (CCD Disc) 1986-87 to 1991-92*. Socioeconomic status data (the percentage of school-age children in poverty) were obtained from the CD-ROM disk *School District Data Book, Version 1.0, June 1994*, also known as the 1990 Census School District Special Tabulation, or as the Census mapping file.

Selection of Observations

Analyses reported are restricted to schools and districts that are located in the 50 states and the District of Columbia. Unless specifically noted, analyses are also restricted to schools in regular school districts (as indicated by an "Education Agency Type Code" of "1" or "2"). Agencies with all other type codes and their schools and students were excluded from analyses. A listing of these type codes follows:

1. Local school district that is not a component of a supervisory union.

2. Local school district component of a supervisory union sharing a superintendent and administrative services with other local school districts.

3. Supervisory union administrative center or a county superintendent serving the same purposes.

4. Regional education service agency or county superintendent serving the same purposes.

5. State-operated institution charged at least in part with providing elementary and/or secondary instruction or services to special needs populations.

6. Federally operated institution charged at least in part with providing elementary and/or secondary instruction or services to special needs populations.

7. Other education agencies that do not fit into the first 6 categories.

It should be noted that school districts with type codes of 1 and 2 accounted for 92 percent (15,358 of 16,694) of the school districts and 98.8 percent of the students in the 50 States and the District of Columbia in 1990-91.

District Imputation Procedures

The CCD State Data Coordinators were not always able to provide all the requested information for all of the school districts and schools in their state. In such cases, missing data were replaced with imputed estimates of the true value for the missing information.

Most district imputations were done via PROC IMPUTE, a statistical imputation procedure developed by A.I.R. for the National Center for Education Statistics. PROC IMPUTE implements a linear regression-based version of hot-deck imputation, simultaneously imputing values for missing data on several variables. Cases with data on a variable are categorized on up to 20 values of a linear regression predictor, based on the other variables. Values are then selected for imputation of missing responses for a variable, on a case-by-case basis, by sampling randomly from the distribution of values in the category specified by the predictor for that case. For cases missing several variables, starting values are imputed cumulatively based on the variables already imputed; and a second "round" of imputation uses these starting values in the regressions.

PROC IMPUTE approximates cumulative distributions for variables that take on more than 10 (integer) values by a series of quadratic (cumulative) segments. It is limited to ordinal variables, in that all variables are treated as numerical. Multiple values that are not ordinally related, such as "program type," must be treated as a series of dichotomies.

Prior to imputing missing values, it was necessary to change certain responses from zero to missing so that they could be imputed. Counts for special education, ungraded, and the different types of diploma recipients had no missing values in 1990-91 and significantly lower mean levels relative to other years. This resulted from a former contractor replacing all missing values with zeroes. To compensate for this, zeros were recoded back to missing values in 1990-91 if the sum of values of a given variable for the other years were nonzero. Similarly, 1990-91 teacher counts that were zero were set to missing if the number of students in that year were nonzero.

The distribution of variables that measured raw numbers (for example, student enrollments) were skewed rather than normal. If the raw numbers were used for imputation, the larger districts would contribute disproportionately to the imputed estimates. Therefore, these variables were transformed prior to imputation to remove the bias of giving extra weight to the larger districts by the following procedures:

(a) The number of special education students was set as a percentage of the number of students in the district. If there were more students with IEPs than students in the district, this value was set to 100 percent.

(b) Student, teacher, and school counts, and 1990-91 Census mapping child counts were transformed to their log values.

In the first set of imputations, the following variables were included and simultaneously imputed:

High grade (1986-87; 1987-88; 1988-89; 1989-90; and 1991-92)
Low grade (1986-87; 1987-88; 1988-89; 1989-90; and 1991-92)
Student/teacher ratio (1986-87; 1987-88; 1988-89; 1989-90; and 1991-92)
Number of teachers (1986-87; 1987-88; 1988-89; 1989-90; and 1991-92)
Number of schools (1986-87; 1987-88; 1988-89; 1989-90; and 1991-92)
Student enrollment (1986-87; 1987-88; 1988-89; 1989-90; and 1991-92)
Metropolitan status (1991-92)
Location code (1991-92)
Type of district (1991-92)
Percentage of children living in poverty (1991-92)
Number of children (1991-92)

A second set of imputations was undertaken to impute the number of special education students. It used the following variables:

Number of students with IEPs (1987-88; 1988-89; 1989-90; and 1991-92)
High grade (1986-87; 1987-88; 1988-89; 1989-90; and 1991-92)
Low grade (1986-87; 1987-88; 1988-89; 1989-90; and 1991-92)
Student/teacher ratio (1986-87; 1987-88; 1988-89; 1989-90; and 1991-92)
Metropolitan status (1991-92)
Number of ungraded students (1987-88; 1988-89; 1989-90; and 1991-92)
Percentage of children living in poverty (1991-92)
Number of children (1991-92)

All but two of these variables were taken from the CCD district file data for each year indicated. (Location code was a new variable, first appearing in the 1991-92 CCD district data file.) The Census Mapping data file was the source of the Percentage of children living in poverty (1991-92) and the Number of children (1991-92) variables.

Operationally, PROC IMPUTE first identified the regression equation that was be the best predictor of each of the above variables. For example, it determined that the best predictor of the lowest grade served by the district in 1989-90 was the lowest grade served by the district in 1990-91. So, if this information was missing for an LEA in 1989-90, the lowest grade served by the district in 1990-91 would be used to identify the distribution of districts with the same low grade and then select the lowest grade served by one of these districts in 1989-90 to replace the missing value. Similarly, the best predictive regression equation for estimating missing student enrollments in 1987-88 took into account the number of schools in the district in 1987-88, the highest grade served by the district in 1987-88, and the district's 1991-92 metropolitan status. The best predictor regression equation taking into account these variables was used to estimate the missing 1987-88 student enrollment. The imputed enrollment was not the value calculated from the regression equation -- it was a value selected from districts with comparable values of the predictor.

After PROC IMPUTE was run, yearly changes in the values of imputed variables greater than 1/16 of 1 percent of the annual sum of values of that variable were recalculated using linear interpolation of nonimputed data available from other years. These interpolated figures were then modified by using annually derived deflators. The number of interpolated, formerly imputed values was quite low (fewer than 50 districts for most variables).

Although district-level imputations were originally carried out without use of information from the CCD school-level files, missing teacher counts were later set to the sum of teacher counts for all of the schools in a district. There were 705 districts for which there were no associated schools for at least one of the years being analyzed. Most of these districts reported student enrollments of 0. However, at least 225 of these districts reported student enrollments in years for which there were no schools. Since these districts tended to have low enrollments, the number of teachers was set to one-tenth of the number of students, rounded to the nearest integer. (For example, if the district reported 23 students but lacked any linkable schools, the number of teachers in this district was set to 2.)

School Data Imputation Procedures

The CCD school-level file had three sets of variables to be imputed: student counts, by race-ethnicity, teacher counts, and locale codes. For the (relatively) invariant locale code, missing values for any given year were set equal to the nonmissing values from other years. Once this was done, only 1,749 missing cases of locale codes remained, all in 1986-87. These were imputed by:

(a) using the locale code for another school in the same district (n=834), or, if no other school were available,

(b) picking the modal value, based on overall distributions by CCD's locale type, Census Mapping's number of urban children, and CCD's membership counts, using the known information for these cases. (915 locale codes were imputed in this manner.)

For teacher counts, across all 5 years, only 2,246 schools were missing data. These were calculated in the following manner:

(a) For schools with teacher counts for some but not all years, teacher counts were set to the values of the other years, with the qualification that if the school enrollment were different by a factor of more than 1.5 from the data from the nonmissing years, the teacher count was set to half way between the value that would keep the teacher count constant and the value that would keep the student/teacher ratio constant.[2]

(b) For schools with no teacher counts for any year, the teacher count was set equal to the modal nonzero integer value of its enrollment divided by the average student/teacher ratio for a school of that size in that year. (The nonzero qualification was added because the modal student/teacher ratio of the smallest sized schools (0-49 enrollment) was zero.)

For racial-ethnic enrollments, missing counts were imputed in the following manner:

(1) If only one ethnicity count were missing, it was set equal to the difference in school enrollment minus the sum of other ethnic enrollments or zero if the sum of nonmissing ethnicities were greater than the enrollment.

(2) If more than one ethnic count was missing and the sum of nonmissing ethnic counts were greater than the enrollment, the missing ethnicity counts were also set to zero.

(3) If more than one ethnic count was missing and the sum of nonmissing counts were less than the enrollment, the difference between the enrollment and the nonmissing counts were apportioned among the missing ethnicity counts according to the average ethnic proportions in other years.

For schools whose data did not follow the patterns described above in (1)- (3), missing ethnicity counts were imputed in the following manner:

(4) If more than one ethnic count was missing and the sum of nonmissing counts were less than the enrollment, and if ethnic data were missing for all years, the difference between the enrollment and the nonmissing counts were apportioned among the missing ethnicity counts according to Census mapping ethnic proportions.

(5) When no enrollment information was available within a year but was available from other years' CCD data, average ethnic proportions for the nonmissing years were multiplied by school membership counts to estimate ethnic counts.

(6) When no ethnic data were available from the CCD for any year, counts were imputed by multiplying ethnic proportions for the district (using Census mapping data) by the school's membership.

(7) If the enrollment for the school was 0, all ethnic counts were set to 0.

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[2] "Half way" is defined as the square root of the product of enrollment for the missing teacher year and the ratio of teacher/(student/teacher) for the nonmissing years.

(8) In the absence of all of the above, ethnic proportions were set equal to the marginal averages for the state, locale code, and year.

In any year, the number of schools for which each imputation methodology was employed could differ as a function of the patterns of missing data. The imputation methodologies (using the numbers indicated above) that were employed in 1987-88 are presented, by racial-ethnic group and state in Figures B.1a-e.

Figure B.1a- Asian/Pacific Islander imputation frequencies, by state: 1987-88

	No imputation		Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		
State	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	School	Percent	Total
AL	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1268	97.7	27	2.1	0	0.0	3	0.2	1298
AK	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	438	96.5	14	3.1	2	0.4	0	0.0	454
AZ	897	93.2	0	0.0	0	0.0	0	0.0	0	0.0	39	4.1	2	0.2	24	2.5	1	0.1	963
AR	1108	99.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	4	0.4	1112
CA	7114	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.0	0	0.0	7117
CO	1300	98.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	18	1.4	0	0.0	1318
CT	945	99.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.2	0	0.0	947
DE	166	99.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.6	0	0.0	167
DC	174	92.6	1	0.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	1.1	11	5.9	188
FL	2165	91.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	214	9.0	0	0.0	2379
GA	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1719	99.7	4	0.2	1	0.1	1724
HI	227	99.1	0	0.0	0	0.0	0	0.0	0	0.0	1	0.4	0	0.0	1	0.4	0	0.0	229
ID	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	538	95.2	0	0.0	27	4.8	565
IL	2342	56.3	40	1.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	34	0.8	1741	41.9	4157
IN	1865	98.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	29	1.5	0	0.0	1894
IA	1628	99.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	5	0.3	1633
KS	1463	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1463
KY	1374	98.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0	24	1.7	0	0.0	1399
LA	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1373	90.3	91	6.0	57	3.8	0	0.0	1521
ME	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	308	89.0	14	4.1	24	6.9	346
MD	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1188	98.5	2	0.1	16	1.3	0	0.0	1206
MA	1739	98.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	23	1.3	0	0.0	1762
MI	3314	95.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	176	5.0	0	0.0	3490
MN	1502	99.3	0	0.0	0	0.0	0	0.0	0	0.0	3	0.2	1	0.1	7	0.5	0	0.0	1513
MS	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	834	87.7	33	3.5	83	8.7	1	0.1	951
MO	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1913	91.3	69	3.3	114	5.4	2096
MT	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	729	94.3	0	0.0	1	0.1	43	5.6	773
NE	1525	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0	1526
NV	260	85.3	7	2.3	3	1.0	3	1.0	2	0.7	3	1.0		0.0	1	0.3	26	8.5	305
NH	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	413	95.8	15	3.5	0	0.0	3	0.7	431
NJ	2210	99.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	17	0.8	0	0.0	2227
NM	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	639	98.6	9	1.4	0	0.0	0	0.0	648
NY	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3897	99.2	26	0.7	0	0.0	7	0.2	3930
NC	1944	99.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	7	0.4	1	0.1	1952
ND	636	99.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.3	0	0.0	638
OH	3653	99.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	21	0.6	0	0.0	3674

Figure B.1a- Asian/Pacific Islander imputation frequencies, by state: 1987-88—Continued

	No imputation		Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		
State	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	School	Percent	Total
OK	1836	99.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.2	0	0.0	1839
OR	1204	99.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	6	0.5	1211
PA	3164	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.1	0	0.0	3166
RI	298	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	298
SC	1032	94.6	0	0.0	0	0.0	0	0.0	0	0.0	8	0.7	0	0.0	50	4.6	1	0.1	1091
SD	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	749	95.2	0	0.0	38	4.8	787
TN	1526	96.7	1	0.1	0	0.0	0	0.0	0	0.0	3	0.2	1	0.1	44	2.8	3	0.2	1578
TX	3365	58.6	243	4.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2139	37.2	5747
UT	720	99.5	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0	0	0.0	0	0.0	3	0.4	724
VT	333	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	333
VA	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1683	96.9	50	2.9	4	0.2	1737
WA	1717	92.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	135	7.3	0	0.0	1852
WV	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	978	90.2	106	9.8	0	0.0	0	0.0	1084
WI	1267	63.3	58	2.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	677	33.8	2002
WY	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	373	95.9	16	4.1	0	0.0	0	0.0	389
Total	56013	68.4	350	0.4	3	0.0	3	0.0	3	0.0	2187	2.7	7254	8.9	1138	1.4	4883	6.0	81834

Figure B.1b- Black, Non-Hispanic imputation frequencies, by state: 1987-88

	No imputation		Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		
State	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	School	Percent	Total
AL	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1268	97.7	27	2.1	0	0.0	3	0.2	1298
AK	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	438	96.5	14	3.1	2	0.4	0	0.0	454
AZ	897	93.2	0	0.0	0	0.0	0	0.0	0	0.0	39	4.1	2	0.2	24	2.5	1	0.1	963
AR	1110	99.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.2	1112
CA	7114	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.0	0	0.0	7117
CO	1300	98.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	18	1.3	0	0.0	1318
CT	945	99.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.2	0	0.0	947
DE	166	99.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.6	0	0.0	167
DC	186	98.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	1.0	0	0.0	188
FL	2165	91.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	214	9.0	0	0.0	2379
GA	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1719	99.7	4	0.2	1	0.0	1724
HI	198	86.4	10	4.3	0	0.0	1	0.4	0	0.0	1	0.4	0	0.0	1	0.4	18	7.8	229
ID	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	538	95.2	0	0.0	27	4.7	565
IL	2754	66.2	38	0.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	34	0.8	1331	32.0	4157
IN	1865	98.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	29	1.5	0	0.0	1894
IA	1627	99.6	1	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	5	0.3	1633
KS	1463	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1463
KY	1374	98.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0	24	1.7	0	0.0	1399
LA	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1373	90.2	91	5.9	57	3.7	0	0.0	1521
ME	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	308	89.0	14	4.0	24	6.9	346
MD	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1188	98.5	2	0.1	16	1.3	0	0.0	1206
MA	1739	98.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	23	1.3	0	0.0	1762
MI	3314	94.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	176	5.0	0	0.0	3490
MN	1502	99.2	0	0.0	0	0.0	0	0.0	0	0.0	3	0.2	1	0.0	7	0.4	0	0.0	1513
MS	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	857	90.1	11	1.1	83	8.7	0	0.0	951
MO	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1913	91.2	69	3.2	114	5.4	2096
MT	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	729	94.3	0	0.0	1	0.1	43	5.5	773
NE	1525	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0	0	0.0	1526
NV	251	82.3	13	4.2	4	1.3	4	1.3	2	0.6	3	0.9	0	0.0	1	0.3	27	8.8	305
NH	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	414	96.0	14	3.2	0	0.0	3	0.7	431
NJ	2210	99.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	17	0.7	0	0.0	2227
NM	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	639	98.6	9	1.3	0	0.0	0	0.0	648
NY	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3897	99.1	26	0.6	0	0.0	7	0.1	3930
NC	1944	99.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	7	0.3	1	0.0	1952
ND	636	99.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.3	0	0.0	638
OH	3653	99.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	21	0.5	0	0.0	3674

Figure B.1b- Black, Non-Hispanic imputation frequencies, by state: 1987-88—Continued

	No imputation		Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		
State	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	School	Percent	Total
OK	1836	99.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.1	0	0.0	1839
OR	1205	99.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0	5	0.4	1211
PA	3164	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.0	0	0.0	3166
RI	298	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	298
SC	1033	94.6	0	0.0	0	0.0	0	0.0	0	0.0	8	0.7	0	0.0	50	4.5	0	0.0	1091
SD	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	749	95.1	0	0.0	38	4.8	787
TN	1528	96.8	0	0.0	0	0.0	0	0.0	0	0.0	3	0.1	1	0.0	44	2.7	2	0.1	1578
TX	4838	84.1	35	0.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	874	15.2	5747
UT	720	99.4	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0	0	0.0	0	0.0	3	0.4	724
VT	333	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	333
VA	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1683	96.8	50	2.8	4	0.2	1737
WA	1717	92.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	135	7.2	0	0.0	1852
WV	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	978	90.2	106	9.7	0	0.0	0	0.0	1084
WI	1053	52.6	145	7.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	804	40.1	2002
WY	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	373	95.8	16	4.1	0	0.0	0	0.0	389
Total	57663	70.5	242	0.3	4	0.0	5	0.0	3	0.0	12211	14.9	7231	8.8	1138	1.4	3337	4.1	81834

Figure B.1c- Hispanic imputation frequencies, by state: 1987-88

	No imputation		Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		
State	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	School	Percent	Total
AL	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1268	97.7	27	2.1	0	0.0	3	0.2	1298
AK	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	438	96.5	14	3.1	2	0.4	0	0.0	454
AZ	897	93.2	0	0.0	0	0.0	0	0.0	0	0.0	39	4.1	2	0.2	24	2.5	1	0.1	963
AR	1108	99.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	4	0.4	1112
CA	7114	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.0	0	0.0	7117
CO	1300	98.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	18	1.4	0	0.0	1318
CT	945	99.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.2	0	0.0	947
DE	166	99.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.6	0	0.0	167
DC	179	95.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	1.1	7	3.7	188
FL	2165	91.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	214	9.0	0	0.0	2379
GA	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1719	99.7	4	0.2	1	0.1	1724
HI	216	94.3	4	1.8	0	0.0	1	0.4	0	0.0	1	0.4	0	0.0	1	0.4	6	2.6	229
ID	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	538	95.2	0	0.0	27	4.8	565
IL	2499	60.1	13	0.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	34	0.8	1611	38.8	4157
IN	1865	98.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	29	1.5	0	0.0	1894
IA	1627	99.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	6	0.4	1633
KS	1463	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1463
KY	1374	98.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	24	1.7	0	0.0	1399
LA	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1373	90.3	91	6.0	57	3.8	0	0.0	1521
ME	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	308	89.0	14	4.1	24	6.9	346
MD	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1188	98.5	2	0.2	16	1.3	0	0.0	1206
MA	1739	98.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	23	1.3	0	0.0	1762
MI	3314	95.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	176	5.0	0	0.0	3490
MN	1502	99.3	0	0.0	0	0.0	0	0.0	0	0.0	3	0.2	1	0.1	7	0.5	0	0.0	1513
MS	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	834	87.7	33	3.5	83	8.7	1	0.1	951
MO	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1913	91.3	69	3.3	114	5.4	2096
MT	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	729	94.3	0	0.0	1	0.1	43	5.6	773
NE	1525	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0	1526
NV	290	95.1	0	0.0	2	0.7	3	1.0	0	0.0	3	1.0	0	0.0	1	0.3	6	2.0	305
NH	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	413	95.8	15	3.5	0	0.0	3	0.7	431
NJ	2210	99.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	17	0.8	0	0.0	2227
NM	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	639	98.6	9	1.4	0	0.0	0	0.0	648
NY	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3897	99.2	26	0.7	0	0.0	7	0.2	3930
NC	1944	99.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	7	0.4	1	0.1	1952
ND	636	99.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.3	0	0.0	638
OH	3653	99.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	21	0.6	0	0.0	3674

Figure B.1c- Hispanic imputation frequencies, by state: 1987-88—Continued

	No imputation		Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		
State	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	School	Percent	Total
OK	1836	99.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.2	0	0.0	1839
OR	1205	99.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	5	0.4	1211
PA	3164	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.1	0	0.0	3166
RI	298	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	298
SC	1032	94.6	0	0.0	0	0.0	0	0.0	0	0.0	8	0.7	0	0.0	50	4.6	1	0.1	1091
SD	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	749	95.2	0	0.0	38	4.8	787
TN	1527	96.8	0	0.0	0	0.0	0	0.0	0	0.0	3	0.2	1	0.1	44	2.8	3	0.2	1578
TX	5586	97.2	7	0.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	154	2.7	5747
UT	720	99.5	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0	0	0.0	0	0.0	3	0.4	724
VT	333	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	333
VA	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1683	96.9	50	2.9	4	0.2	1737
WA	1717	92.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	135	7.3	0	0.0	1852
WV	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	978	90.2	106	9.8	0	0.0	0	0.0	1084
WI	1217	60.8	74	3.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	711	35.5	2002
WY	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	373	95.9	16	4.1	0	0.0	0	0.0	389
Total	58366	71.3	98	0.1	2	0.0	4	0.0	1	0.0	12187	14.9	7254	8.9	1138	13.9	2784	3.4	81834

Figure B.1d- Native American imputation frequencies, by state: 1987-88

	No imputation		Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		
State	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	School	Percent	Total
AL	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1268	97.7	27	2.1	0	0.0	3	0.2	1298
AK	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	438	96.5	14	3.1	2	0.4	0	0.0	454
AZ	897	93.2	0	0.0	0	0.0	0	0.0	0	0.0	39	4.1	2	0.2	24	2.5	1	0.1	963
AR	1108	99.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	4	0.4	1112
CA	7114	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.0	0	0.0	7117
CO	1300	98.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	18	1.4	0	0.0	1318
CT	945	99.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.2	0	0.0	947
DE	166	99.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.6	0	0.0	167
DC	172	91.5	2	1.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	1.1	12	6.4	188
FL	2165	91.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	214	9.0	0	0.0	2379
GA	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1719	99.7	4	0.2	1	0.1	1724
HI	162	70.7	44	19.2	0	0.0	2	0.9	0	0.0	1	0.4	0	0.0	1	0.4	19	8.3	229
ID	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	538	95.2	0	0.0	27	4.8	565
IL	724	17.4	1087	26.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	34	0.8	2312	55.6	4157
IN	1865	98.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	29	1.5	0	0.0	1894
IA	1625	99.5	2	0.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	6	0.4	1633
KS	1463	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1463
KY	1374	98.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0	24	1.7	0	0.0	1399
LA	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1373	90.3	91	6.0	57	3.8	0	0.0	1521
ME	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	308	89.0	14	4.1	24	6.9	346
MD	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1188	98.5	2	0.2	16	1.3	0	0.0	1206
MA	1739	98.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	23	1.3	0	0.0	1762
MI	3314	95.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	176	5.0	0	0.0	3490
MN	1502	99.3	0	0.0	0	0.0	0	0.0	0	0.0	3	0.2	1	0.1	7	0.5	0	0.0	1513
MS	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	834	87.7	33	3.5	83	8.7	1	0.1	951
MO	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1913	91.3	69	3.3	114	5.4	2096
MT	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	729	94.3	0	0.0	1	0.1	43	5.6	773
NE	1525	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0	1526
NV	283	92.8	1	0.3	1	0.3	2	0.7	1	0.3	3	1.0	0	0.0	1	0.3	13	4.3	305
NH	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	412	95.6	16	3.7	0	0.0	3	0.7	431
NJ	2210	99.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	17	0.8	0	0.0	2227
NM	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	639	98.6	9	1.4	0	0.0	0	0.0	648
NY	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3897	99.2	26	0.7	0	0.0	7	0.2	3930
NC	1944	99.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	7	0.4	1	0.1	1952
ND	636	99.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.3	0	0.0	638
OH	3653	99.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	21	0.6	0	0.0	3674

Figure B.1d- Native American imputation frequencies, by state: 1987-88—Continued

	No imputation		Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		
State	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	School	Percent	Total
OK	1836	99.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.2	0	0.0	1839
OR	1202	99.3	2	0.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	6	0.5	1211
PA	3164	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.1	0	0.0	3166
RI	298	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	298
SC	1032	94.6	0	0.0	0	0.0	0	0.0	0	0.0	8	0.7	0	0.0	50	4.6	1	0.0	1091
SD	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	749	95.2	0	0.0	38	4.8	787
TN	1526	96.7	1	0.1	0	0.0	0	0.0	0	0.0	3	0.2	1	0.1	44	2.8	3	0.2	1578
TX	1787	31.1	1680	29.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2280	39.7	5747
UT	720	99.5	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0	0	0.0	0	0.0	3	0.4	724
VT	333	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	333
VA	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1683	96.9	50	2.9	4	0.2	1737
WA	1717	92.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	135	7.3	0	0.0	1852
WV	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	978	90.2	106	9.8	0	0.0	0	0.0	1084
WI	1056	52.8	171	8.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	775	38.7	2002
WY	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	373	95.9	16	4.1	0	0.0	0	0.0	389
Total	52557	64.2	2990	3.7	1	0.0	4	0.0	2	0.0	12186	14.9	7255	8.9	1138	1.4	5701	7.0	81834

Figure B.1e- White imputation frequencies, by state: 1987-88

	No imputation		Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		
State	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	School	Percent	Total
AL	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1268	97.7	27	2.1	0	0.0	3	0.2	1298
AK	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	438	96.5	14	3.1	2	0.4	0	0.0	454
AZ	897	93.2	0	0.0	0	0.0	0	0.0	0	0.0	39	4.1	2	0.2	24	2.5	1	0.1	963
AR	1112	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1112
CA	7114	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.0	0	0.0	7117
CO	1300	98.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	18	1.4	0	0.0	1318
CT	945	99.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.2	0	0.0	947
DE	166	99.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.6	0	0.0	167
DC	178	94.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	1.1	8	4.3	188
FL	2165	91.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	214	9.0	0	0.0	2379
GA	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1719	99.7	4	0.2	1	0.1	1724
HI	226	98.7	0	0.0	0	0.0	0	0.0	0	0.0	1	0.4	0	0.0	1	0.4	1	0.4	229
ID	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	538	95.2	0	0.0	27	4.8	565
IL	3871	93.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	34	0.8	252	6.1	4157
IN	1865	98.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	29	1.5	0	0.0	1894
IA	1633	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1633
KS	1463	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1463
KY	1374	98.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	24	1.7	0	0.0	1399
LA	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1373	90.3	91	6.0	57	2.7	0	0.0	1521
ME	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	308	89.0	14	4.1	24	6.9	346
MD	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1188	98.5	2	0.2	16	1.3	0	0.0	1206
MA	1739	98.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	23	1.3	0	0.0	1762
MI	3314	95.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	176	5.0	0	0.0	3490
MN	1502	99.3	0	0.0	0	0.0	0	0.0	0	0.0	3	0.2	1	0.1	7	0.5	0	0.0	1513
MS	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	851	89.5	17	1.8	83	8.7	0	0.0	951
MO	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1913	91.3	69	3.3	114	5.4	2096
MT	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	729	94.3	0	0.0	1	0.1	43	5.6	773
NE	1525	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0	1526
NV	298	97.7	1	0.3	0	0.0	0	0.0	0	0.0	3	1.0	0	0.0	1	0.3	2	0.7	305
NH	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	417	96.8	11	2.6	0	0.0	3	0.7	431
NJ	2210	99.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	17	0.8	0	0.0	2227
NM	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	639	98.6	9	1.3	0	0.0	0	0.0	648
NY	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3897	99.1	26	0.7	0	0.0	7	0.2	3930
NC	1945	99.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	7	0.4	0	0.0	1952
ND	636	99.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.3	0	0.0	638
OH	3653	99.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	21	0.6	0	0.0	3674

Figure B.1e- White imputation frequencies, by state: 1987-88

	No imputation		Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		
State	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent	School	Percent	Total
OK	1836	99.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.2	0	0.0	1839
OR	1210	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0	1211
PA	3164	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.1	0	0.0	3166
RI	298	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	298
SC	1032	94.6	0	0.0	0	0.0	0	0.0	0	0.0	8	0.7	0	0.0	50	4.6	1	0.1	1091
SD	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	749	95.2	0	0.0	38	4.8	787
TN	1530	97.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.2	1	0.1	44	2.8	0	0.0	1578
TX	5673	98.7	3	0.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	71	1.2	5747
UT	724	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	724
VT	333	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	333
VA	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1683	96.9	50	2.9	4	0.2	1737
WA	1717	92.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	135	7.3	0	0.0	1852
WV	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	978	90.2	106	9.8	0	0.0	0	0.0	1084
WI	1999	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.2	2002
WY	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	373	95.9	16	4.1	0	0.0	0	0.0	389
Total	60647	74.1	4	0.0	0	0.0	0	0.0	0	0.0	12208	14.9	7234	8.9	1138	1.4	603	0.7	81834

Data Cleaning

Locale (school) codes. In the 1990-91 CCD, a significant proportion (7 percent) of the school locale codes changed from the previous year: In two states, over 90 percent of the schools were assigned locale codes different from the previous year's; in a third state, one-third (34 percent) of the schools were assigned different locale codes. To preserve the integrity of the longitudinal data series, the 1990-91 locale codes were set equal to their 1989-90 values (when data were available).

Student/teacher ratios. CCD agency and school files also contain a student/teacher ratio variable. This variable was not always equivalent to the reported number of students divided by the reported number of teachers. The student/teacher ratios presented in this report are the reported number of students divided by the reported numbers of teachers.

Generally, the total number of students in a regular district was close to the aggregated number of students in all of the district's schools. In 1986-87, there was exact agreement between these counts in 60 percent of the districts; in 1987-88, 83 percent; in 1988-89, 78 percent; in 1989-90, 79 percent; and in 1990-91, 85 percent. Except for 1986-87, the net effect of these discrepancies did not alter counts by more than 0.2 percent. In 1986-87, districts overall reported 626,956 (1.6 percent) more students than the aggregated student total.

Exceptionally high student/teacher ratios were reduced in the following manner: Student/teacher ratios were compared with previous years (for the school). If the difference was in excess of 100, the smaller of the ratios was assumed to be the correct one.

Ungraded student/PK-12 student counts (district). Missing values for the number of ungraded students were set equal to the difference between total students and students in grades PK-12 because there were no districts for which both ungraded and PK-12 students were missing. The reverse was also done—namely the number of PK-12 students was set equal to the difference in total students minus ungraded students.

Students with IEPs, ungraded student counts, diploma recipients: District level, 1990-91. As previously noted, in the 1990-91 CCD district file, a former contractor apparently replaced missing values with zeroes for these variables. If these variables had nonzero values in former years, the 1990-91 zero was set to missing and its value was subsequently imputed.

Teacher counts: District level, 1990-91. Slightly different criteria than those mentioned above were used to identify questionable zero teacher counts in the 1990-91 data file. If student counts in 1990-91 were nonzero, teacher counts were set to missing, and then subsequently imputed.

Revised imputation of 1986-87 enrollment figures. Examination of 1986-87 enrollment figures indicated that they required additional editing and imputation. These editing procedures were carried out subsequent to other analyses, and 1986-87 enrollment and student/teacher ratio figures in the report reflect the additional editing and imputation.

Multivariate Analyses

Since the various factors on which school districts (and schools) differ are correlated with each other (e.g., enrollment size and urbanicity), one cannot tell from marginal averages which of several descriptive measures are directly related to variation in a dependent measure. By simultaneously permitting all of the descriptive factors under study to account for variation in the dependent variable (e.g., student/teacher ratios), one can identify which measures are directly related to the dependent variable and which are only indirectly related through their correlations with other, directly related measures. Conceptually, this is done by finding out which of the measures is correlated with the dependent variable when the analysis is restricted to districts that are equal on the other measures. If a factor is correlated with the dependent variable when districts are equal on all of the other measures included in an analysis, then it is more likely that this factor represents a determinant of variation in the dependent variable. If its correlation with the dependent variable evaporates when examining only districts that are equal on other factors, then that factor is only an apparent contributor to variance in the dependent variable. The power and accuracy of this type of analysis is, of course, limited by the ability to specify the model correctly and fully using available data.

The statistical methods of analysis of variance and multiple linear regression are special cases of the general linear model (GLM) and were conducted using the SAS program PROC GLM. The general linear model, as used here, summarizes the data on schools or districts under the assumption that variation in the mean value of some information on schools or districts (e.g., number of teachers) can be partitioned into variation in the mean values between categories of schools or districts (e.g., small, medium, and large) and variation between schools or districts within a category.

In the present GLM analysis, districts are categorized by four levels of size, of minority percentage, and of poverty percentage, and by three levels of urbanicity, as shown, for example, in table 2.2. The model specification includes only main effects, not interactions: that is, no attempt has been made to report effects of interactions, beyond their additive contribution to variation. If the effect of poverty, for example, is, by itself, greater in large than in small districts, that is not included in the analysis -- only the separate and additive contributions of poverty and size to variation in school districts are displayed.

We suppose that a measure, $y(i,j,k,l)$, for districts with a particular combination of characteristics (i,j,k,l) is distributed with a mean equal to the overall mean, plus a deviation associated with each individual characteristic:

[1] $$y(i,j,k,l) = mu + (alpha(i)-mu) + (beta(j)-mu) + (gamma(k)-mu) + (delta(l)-mu) \\ + \text{random variation.}$$

(We are using "i" to refer both to a characteristic (e.g., size) and to a value of that characteristic (e.g., large), because the context makes the meaning clear.)

The simple sample mean of y for characteristic (i) may be different from the overall mean even if there is no direct relationship between (i) and y (i.e., even if alpha(i)-mu is zero), if districts with characteristic (i) tend also to have characteristic (j) and characteristic (j) has a direct relationship with y (i.e., beta(j)-mu is not zero). To display the direct relationship between characteristic (i) and y, we compute the least square mean, or equated mean, lsm(i):

[2] lsm(i) = mu + (alpha(i)-mu).

Specifically, the GLM analysis estimates the effects in [1] and recomputes what the mean of y would be if the only variation were due to characteristic (i).

For most of the school-level analyses performed, the model used was:

Dependent variable = school size, school locale, school type, grade range, and school percent minority

For district analyses, the model used was:

Dependent variable = district size, district metropolitan status, district SES, district percent minority

In these models, each of the factors was a categorical variable, making the model analogous to an analysis of variance model. Thus, no assumptions of linearity of relations were imposed. Based on the estimates produced, it was possible to compute least squares means (or equated means). These means present what the dependent variable means in the marginal cells would have been if the model had been used in a population in which the factors were uncorrelated.

The equated means in this report were derived from SAS PROC GLM printouts of "least squares means." SAS adjusts printed least squares means to represent what the means would be if there were an equal number of cases at each level of each factor. That adjustment can lead to erroneous interpretations, so in this report a constant was added to the least square means printed by SAS, so that the overall mean of the least squares means would be the same as the true population mean. Therefore, in all tables, the overall average least squares mean, or "equated mean," is equal to the simple overall mean, by definition.

Tests of Statistical Significance

No tests of statistical significance were performed since population parameters were based on the entire population rather than a sample. When an entire population is surveyed, mean values represent a population characteristic rather than an estimate of this characteristic.

Additional Analyses

Additional analyses were performed to show the distribution of schools by locale (in 1990-91) and the prevalence and distribution of missing racial-ethnic data over time. Results of these analyses are summarized in the following tables.

Distribution of schools by locale. The district metropolitan status codes describe the type of district in which a school is located; the seven-category school locale codes, the type of locale in which a school is located. (This finer-grained classification schema was also used to classify districts in 1991-92.) In order to show the relationships between school locale codes and district metropolitan status codes, the following table (see figure B.2) was prepared. It summarizes 1990-91 CCD data, showing the numbers of schools in each classification category.

Figure B.2- 1990-91 CCD: School counts, by school locale and district metropolitan status codes

	Metropolitan Status of District			
Locale of school	Urban	Suburban	Other	Total
Overall	17,435	34,843	31,063	83,341
Column percent	20.9%	41.8%	37.3%	100.0%
Large city	6,537	1,104	9	7,650
Row percent	85.5%	14.4%	0.1%	100.0%
Column percent	37.5%	3.2%	0.0%	9.2%
Mid-size city	8,027	3,694	156	1,1877
Row percent	67.6%	31.1%	1.3%	100.0%
Column percent	46.0%	10.6%	0.5%	14.3%
Urban fringe - Large city	894	10,998	60	11,952
Row percent	7.5%	92.0%	0.5%	100.0%
Column percent	5.1%	31.6%	0.2%	14.3%
Urban fringe - Mid-size city	1,444	6,429	340	8,213
Row percent	17.6%	78.3%	4.1%	100.0%
Column percent	8.3%	18.5%	1.1%	9.9%
Large town	71	436	1,333	1,840
Row percent	3.9%	23.7%	72.5%	100.0%
Column percent	0.4%	1.3%	4.3%	2.2%
Small town	162	6,472	12,354	18,988
Row percent	0.9%	34.1%	65.1%	100.0%
Column percent	0.9%	18.6%	39.8%	22.8%
Rural	300	5,710	16,811	22,821
Row percent	1.3%	250%	73.7%	100.0%
Column percent	1.7%	16.4%	54.1%	27.4%

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data Surveys 1986-87 - 1990-91

Number and proportions of schools missing race-ethnicity data. Two sets of tables (figures B.3 and B.4) were prepared. The first indicates the number and proportion of schools for which any race-ethnicity data were missing. It was not uncommon for counts to be provided about all but one racial-ethnic group (typically, Native Americans). Since racial-ethnic counts and total student counts for a school were not always provided as of the same date, it was not possible to logically impute a value for a missing count through simple subtractions.

The second set of tables indicates the number and proportion of schools for which no racial-ethnic counts were provided. The counts for all five racial-ethnic categories in these schools were missing. Since no racial-ethnic counts were provided for 1986-87, data for this year are not summarized.

Figure B.3- Number and proportions of schools missing ANY race-ethnicity data, by state and year

	1987-88			1988-89			1989-90			1990-91		
State	Schools	Schools missing data	Percent	Schools	Schools missing data	Percent	Schools	Schools missing data	Percent	Schools	Schools missing data	Percent
TOTAL	81834	30345	37.1	81644	21500	26.3	82246	15194	18.5	83341	9208	11.0
AL	1298	1298	100.0	1289	0	0.0	1289	0	0.0	1294	0	0.0
AK	454	454	100.0	451	8	1.8	493	10	2.0	498	9	1.8
AZ	963	66	6.9	1017	52	5.1	1021	377	36.9	1043	39	3.7
AR	1112	4	0.4	1094	878	80.3	1097	3	0.3	1091	0	0.0
CA	7117	3	0.0	7237	2	0.0	7331	0	0.0	7820	366	4.7
CO	1318	18	1.4	1334	13	1.0	1329	11	0.8	1336	13	1.0
CT	947	2	0.2	950	0	0.0	957	714	74.6	959	1	0.1
DE	167	1	0.6	168	1	0.6	170	122	71.8	173	3	1.7
DC	188	17	9.0	187	187	100.0	184	1	0.5	181	0	0.0
FL	2379	214	9.0	2432	230	9.5	2505	227	9.1	2516	195	7.8
GA	1724	1724	100.0	1728	1728	100.0	1732	1732	100.0	1734	1734	100.0
HI	229	81	35.4	231	0	0.0	234	0	0.0	235	0	0.0
ID	565	565	100.0	561	561	100.0	573	573	100.0	582	582	100.0
IL	4157	3573	86.0	4065	3478	85.6	4067	3461	85.1	4080	29	0.7
IN	1894	29	1.5	1888	27	1.4	1890	31	1.6	1882	33	1.8
IA	1633	9	0.6	1622	2	0.1	1607	1	0.1	1588	0	0.0
KS	1463	0	0.0	1465	0	0.0	1459	0	0.0	1477	0	0.0
KY	1399	25	1.8	1394	24	1.7	1385	24	1.7	1400	33	2.4
LA	1521	1521	100.0	1505	1505	100.0	1458	1	0.1	1454	0	0.0
ME	346	346	100.0	369	369	100.0	732	732	100.0	731	731	100.0
MD	1206	1206	100.0	1217	17	1.4	1217	12	1.0	1220	4	0.3
MA	1762	23	1.3	1626	3	0.2	1617	8	0.5	1641	44	2.7
MI	3490	176	5.0	3277	1	0.0	3314	0	0.0	3255	17	0.5
MN	1513	11	0.7	1506	3	0.2	1510	4	0.3	1522	9	0.6
MS	951	951	100.0	953	953	100.0	950	80	8.4	952	83	8.7
MO	2096	2096	100.0	2099	2099	100.0	2097	2097	100.0	2196	2196	100.0
MT	773	773	100.0	759	759	100.0	758	758	100.0	897	0	0.0
NE	1526	1	0.1	1501	2	0.1	1473	2	0.1	1453	1	0.1
NV	305	65	21.3	315	7	2.2	331	2	0.6	353	3	0.8

Figure B.3- Number and proportions of schools missing ANY race-ethnicity data, by state and year—Continued

	1987-88			1988-89			1989-90			1990-91		
State	Schools	Schools missing data	Percent	Schools	Schools missing data	Percent	Schools	Schools missing data	Percent	Schools	Schools missing data	Percent
NH	431	431	100.0	431	431	100.0	440	377	85.7	439	2	0.5
NJ	2227	17	0.8	2236	15	0.7	2242	16	0.7	2247	17	0.8
NM	648	648	100.0	651	651	100.0	658	1	0.2	673	0	0.0
NY	3930	3930	100.0	3942	0	0.0	3955	0	0.0	3969	143	3.6
NC	1952	8	0.4	1948	6	0.3	1950	8	0.4	1950	8	0.4
ND	638	2	0.3	627	0	0.0	628	0	0.0	611	0	0.0
OH	3674	21	0.6	3677	18	0.5	3654	12	0.3	3670	23	0.6
OK	1839	3	0.2	1832	66	3.6	1859	2	0.1	1880	1	0.1
OR	1211	9	0.7	1203	2	0.2	1187	1	0.1	1193	0	0.0
PA	3166	2	0.1	3146	4	0.1	3131	2	0.1	3116	3	0.1
RI	298	0	0.0	299	2	0.7	291	192	66.0	307	0	0.0
SC	1091	59	5.4	1089	57	5.2	1086	62	5.7	1097	57	5.2
SD	787	787	100.0	781	781	100.0	789	789	100.0	792	792	100.0
TN	1578	53	3.4	1565	1462	93.4	1535	31	2.0	1543	26	1.7
TX	5747	4302	74.9	5824	5	0.1	5937	64	1.1	5991	0	0.0
UT	724	4	0.6	729	0	0.0	717	0	0.0	714	1	0.1
VT	333	0	0.0	331	318	96.1	336	319	94.9	397	33	8.3
VA	1737	1737	100.0	1741	1741	100.0	1755	1755	100.0	1805	1805	100.0
WA	1852	135	7.3	1870	138	7.4	1858	132	7.1	1936	129	6.7
WV	1084	1084	100.0	1065	1065	100.0	1035	44	4.3	1015	42	4.1
WI	2002	1472	73.5	2009	1421	70.7	2019	0	0.0	2018	1	0.0
WY	389	389	100.0	408	408	100.0	404	404	100.0	415	0	0.0

Figure B.4- Number and proportions of schools missing ALL race-ethnicity data, by state and year

	1987-88			1988-89			1989-90			1990-91		
State	Schools	Schools missing data	Percent	Schools	Schools missing data	Percent	Schools	Schools missing data	Percent	Schools	Schools missing data	Percent
TOTAL	81834	20845	25.5	81644	13106	16.1	82246	9684	11.8	83341	9066	10.9
AL	1298	1298	100.0	1289	0	0.0	1289	0	0.0	1294	0	0.0
AK	454	454	100.0	451	8	1.8	493	10	2.0	498	9	1.8
AZ	963	66	6.9	1017	52	5.1	1021	43	4.2	1043	39	3.7
AR	1112	0	0.0	1094	1	0.1	1097	0	0.0	1091	0	0.0
CA	7117	3	0.0	7237	2	0.0	7331	0	0.0	7820	366	4.7
CO	1318	18	1.4	1334	13	1.0	1329	11	0.8	1336	13	1.0
CT	947	2	0.2	950	0	0.0	957	0	0.0	959	1	0.1
DE	167	1	0.6	168	1	0.6	170	3	1.8	173	3	1.7
DC	188	2	1.1	187	187	100.0	184	1	0.5	181	0	0.0
FL	2379	214	9.0	2432	230	9.5	2505	227	9.1	2516	195	7.8
GA	1724	1724	100.0	1728	1728	100.0	1732	1732	100.0	1734	1734	100.0
HI	229	2	0.9	231	0	0.0	234	0	0.0	235	0	0.0
ID	565	565	100.0	561	561	100.0	573	573	100.0	582	582	100.0
IL	4157	34	0.8	4065	4	0.1	4067	14	0.3	4080	29	0.7
IN	1894	29	1.5	1888	27	1.4	1890	31	1.6	1882	33	1.8
IA	1633	0	0.0	1622	2	0.1	1607	1	0.1	1588	0	0.0
KS	1463	0	0.0	1465	0	0.0	1459	0	0.0	1477	0	0.0
KY	1399	25	1.8	1394	24	1.7	1385	24	1.7	1400	33	2.4
LA	1521	1521	100.0	1505	1505	100.0	1458	1	0.1	1454	0	0.0
ME	346	346	100.0	369	369	100.0	732	732	100.0	731	731	100.0
MD	1206	1206	100.0	1217	17	1.4	1217	12	1.0	1220	4	0.3
MA	1762	23	1.3	1626	3	0.2	1617	8	0.5	1641	44	2.7
MI	3490	176	5.0	3277	1	0.0	3314	0	0.0	3255	17	0.5
MN	1513	11	0.7	1506	3	0.2	1510	4	0.3	1522	9	0.6
MS	951	951	100.0	953	79	8.3	950	80	8.4	952	83	8.7
MO	2096	2096	100.0	2099	2099	100.0	2097	2097	100.0	2196	2196	100.0
MT	773	773	100.0	759	759	100.0	758	758	100.0	897	0	0.0
NE	1526	1	0.1	1501	2	0.1	1473	2	0.1	1453	1	0.1
NV	305	4	1.3	315	2	0.6	331	2	0.6	353	3	0.8

Figure B.4- Number and proportions of schools missing ALL race-ethnicity data, by state and year—Continued

	1987-88			1988-89			1989-90			1990-91		
State	Schools	Schools missing data	Percent	Schools	Schools missing data	Percent	Schools	Schools missing data	Percent	Schools	Schools missing data	Percent
NH	431	431	100.0	431	431	100.0	440	0	0.0	439	2	0.5
NJ	2227	17	0.8	2236	15	0.7	2242	16	0.7	2247	17	0.8
NM	648	648	100.0	651	651	100.0	658	0	0.0	673	0	0.0
NY	3930	3930	100.0	3942	0	0.0	3955	0	0.0	3969	1	0.0
NC	1952	7	0.4	1948	6	0.3	1950	8	0.4	1950	8	0.4
ND	638	2	0.3	627	0	0.0	628	0	0.0	611	0	0.0
OH	3674	21	0.6	3677	18	0.5	3654	12	0.3	3670	23	0.6
OK	1839	3	0.2	1832	66	3.6	1859	2	0.1	1880	1	0.1
OR	1211	1	0.1	1203	2	0.2	1187	1	0.1	1193	0	0.0
PA	3166	2	0.1	3146	4	0.1	3131	2	0.1	3116	3	0.1
RI	298	0	0.0	299	2	0.7	291	1	0.3	307	0	0.0
SC	1091	58	5.3	1089	57	5.2	1086	60	5.5	1097	57	5.2
SD	787	787	100.0	781	781	100.0	789	789	100.0	792	792	100.0
TN	1578	48	3.0	1565	37	2.4	1535	28	1.8	1543	26	1.7
TX	5747	0	0.0	5824	5	0.1	5937	64	1.1	5991	0	0.0
UT	724	0	0.0	729	0	0.0	717	0	0.0	714	1	0.1
VT	333	0	0.0	331	0	0.0	336	0	0.0	397	33	8.3
VA	1737	1737	100.0	1741	1741	100.0	1755	1755	100.0	1805	1805	100.0
WA	1852	135	7.3	1870	138	7.4	1858	132	7.1	1936	129	6.7
WV	1084	1084	100.0	1065	1065	100.0	1035	44	4.3	1015	42	4.1
WI	2002	0	0.0	2009	0	0.0	2019	0	0.0	2018	1	0.0
WY	389	389	100.0	408	408	100.0	404	404	100.0	415	0	0.0

In order to assess the impact of the racial-ethnic imputations, nonimputed, imputed, and overall racial-ethnic counts are presented for 1987-88 CCD school data, on a state-by-state basis (see Figure B.5).

Figure B.5- Imputed, nonimputed, and overall racial-ethnic counts and percentages, by state: 1987-88 CCD school data

State		Asian/Pacific Islander		Black		Hispanic		Native American		White	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
TOTAL	Imputed	233509	2.3	2392749	24.0	697181	7.0	121276	1.2	6545040	65.5
	Nonimputed	978343	3.3	4207916	14.0	3393898	11.3	259171	0.9	21134198	70.5
	Overall	1211852	3.0	6600665	16.5	4091079	10.2	380447	1.0	27679238	69.3
AL	Imputed	3398	0.5	261567	35.9	1496	0.2	4569	0.6	456930	62.8
	Nonimputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Overall	3398	0.5	261567	35.9	1496	0.2	4569	0.6	456930	62.8
AK	Imputed	3859	3.6	4764	4.5	2073	2.0	23728	22.4	71646	67.5
	Nonimputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Overall	3859	3.6	4764	4.5	2073	2.0	23728	22.4	71646	67.5
AZ	Imputed	262	1.4	460	2.5	2548	14.0	1807	9.9	13151	72.1
	Nonimputed	8642	1.4	24542	4.0	136489	22.4	37981	6.2	401118	65.9
	Overall	8904	1.4	25002	4.0	139037	22.2	39788	6.3	414269	66.1
AR	Imputed	14	16.1	64	73.6	5	5.7	4	4.6	0	0.0
	Nonimputed	2618	0.6	103921	23.8	1440	0.3	907	0.2	328183	75.1
	Overall	2632	0.6	103985	23.8	1445	0.3	911	0.2	328183	75.1
CA	Imputed	0	20.0	0	20.0	0	20.0	0	20.0	0	20.0
	Nonimputed	444297	9.9	409030	9.1	1353134	30.1	34122	0.8	2247624	50.1
	Overall	444297	9.9	409030	9.1	1353134	30.1	34122	0.8	2247624	50.1
CO	Imputed	0	20.0	0	20.0	0	20.0	0	20.0	0	20.0
	Nonimputed	11877	2.1	28274	5.1	86682	15.5	4263	0.8	428231	76.6
	Overall	11877	2.1	28274	5.1	86682	15.5	4263	0.8	428231	76.6
CT	Imputed	0	20.0	0	20.0	0	20.0	0	20.0	0	20.0
	Nonimputed	8320	1.9	54794	12.2	39959	8.9	739	0.2	344195	76.8
	Overall	8320	1.9	54794	12.2	39959	8.9	739	0.2	344195	76.8
DE	Imputed	0	20.0	0	20.0	0	20.0	0	20.0	0	20.0
	Nonimputed	1312	1.4	25621	26.8	2330	2.4	124	0.1	66272	69.3
	Overall	1312	1.4	25621	26.8	2330	2.4	124	0.1	66272	69.3
DC	Imputed	30	18.0	0	0.0	99	59.3	1	0.6	37	22.2
	Nonimputed	915	1.1	78897	91.4	3430	4.0	46	0.1	3008	3.5
	Overall	945	1.1	78897	91.2	3529	4.1	47	0.1	3045	3.5
FL	Imputed	0	20.0	0	20.0	0	20.0	0	20.0	0	20.0
	Nonimputed	21297	1.3	393332	23.6	167983	10.1	2778	0.2	1078307	64.8
	Overall	21297	1.3	393332	23.6	167983	10.1	2778	0.2	1078307	64.8
GA	Imputed	13117	1.2	370677	33.8	18152	1.7	2271	0.2	693665	63.2
	Nonimputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Overall	13117	1.2	370677	33.8	18152	1.7	2271	0.2	693665	63.2

Figure B.5- Imputed, nonimputed, and overall racial-ethnic counts and percentages, by state: 1987-88 CCD school data—Continued

State		Asian/Pacific Islander		Black		Hispanic		Native American		White	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
HI	Imputed	251	33.0	109	14.3	32	4.2	151	19.9	217	28.6
	Nonimputed	118945	71.8	4249	2.6	3719	2.2	495	0.3	38167	23.1
	Overall	119196	71.7	4358	2.6	3751	2.3	646	0.4	38384	23.1
ID	Imputed	1829	0.9	726	0.3	15281	7.2	3042	1.4	191184	90.2
	Nonimputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Overall	1829	0.9	726	0.3	15281	7.2	3042	1.4	191184	90.2
IL	Imputed	16718	11.6	26820	18.7	55532	38.7	2279	1.6	42163	29.4
	Nonimputed	43706	2.4	398663	22.2	152987	8.5	2113	0.1	1200127	66.8
	Overall	60424	3.1	425483	21.9	208519	10.7	4392	0.2	1242290	64.0
IN	Imputed	0	20.0	0	20.0	0	20.0	0	20.0	0	20.0
	Nonimputed	5533	0.6	103617	10.8	16745	1.7	1125	0.1	832937	86.8
	Overall	5533	0.6	103617	10.8	16745	1.7	1125	0.1	832937	86.8
IA	Imputed	5	20.0	13	52.0	6	24.0	1	4.0	0	0.0
	Nonimputed	5570	1.2	12624	2.6	4560	0.9	1336	0.3	456425	95.0
	Overall	5575	1.2	12637	2.6	4566	1.0	1337	0.3	456425	95.0
KS	Imputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Nonimputed	6929	1.7	33172	7.9	15708	3.7	2821	0.7	361008	86.0
	Overall	6929	1.7	33172	7.9	15708	3.7	2821	0.7	361008	86.0
KY	Imputed	0	0.0	0	0.0	0	0.0	0	0.0	57	100.0
	Nonimputed	2349	0.4	59908	9.3	929	0.1	222	0.0	579288	90.1
	Overall	2349	0.4	59908	9.3	929	0.1	222	0.0	579345	90.1
LA	Imputed	8334	1.1	344919	44.6	7796	1.0	3003	0.4	409196	52.9
	Nonimputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Overall	8334	1.1	344919	44.6	7796	1.0	3003	0.4	409196	52.9
ME	Imputed	1251	1.2	707	0.7	1080	1.0	541	0.5	103419	96.7
	Nonimputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Overall	1251	1.2	707	0.7	1080	1.0	541	0.5	103419	96.7
MD	Imputed	22478	3.2	227766	33.3	13972	2.0	1475	0.2	418126	61.1
	Nonimputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Overall	22478	3.3	227766	33.3	13972	2.0	1475	0.2	418126	61.1
MA	Imputed	0	20.0	0	20.0	0	20.0	0	20.0	0	20.0
	Nonimputed	21649	2.7	58083	7.3	48700	6.1	1000	0.1	664763	83.7
	Overall	21649	2.7	58083	7.3	48700	6.1	1000	0.1	664763	83.7

Figure B.5- Imputed, nonimputed, and overall racial-ethnic counts and percentages, by state: 1987-88 CCD school data—Continued

State		Asian/Pacific Islander		Black		Hispanic		Native American		White	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
MI	Imputed	0	20.0	0	20.0	0	20.0	0	20.0	0	20.0
	Nonimputed	16906	1.1	288515	18.2	34029	2.1	14112	0.9	1234814	77.7
	Overall	16906	1.1	288515	18.2	34029	2.1	14112	0.9	1234814	77.7
MN	Imputed	80	3.7	50	2.3	11	0.5	4	0.2	2008	93.3
	Nonimputed	17852	2.5	20021	2.8	7073	1.0	11564	1.6	651433	92.0
	Overall	17932	2.5	20071	2.8	7084	1.0	11568	1.6	653441	92.0
MS	Imputed	2176	0.4	251271	50.8	806	0.2	668	0.1	239468	48.4
	Nonimputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Overall	2176	0.4	251271	50.8	806	0.2	668	0.1	239468	48.4
MO	Imputed	6616	0.8	97147	12.1	12755	1.6	3689	0.5	680893	85.0
	Nonimputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Overall	6616	0.8	97147	12.1	12755	1.6	3689	0.5	680893	85.0
MT	Imputed	1013	0.7	614	0.4	1940	1.3	13825	9.1	134654	88.6
	Nonimputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Overall	1013	0.7	614	0.4	1940	1.3	13825	9.1	134654	88.6
NE	Imputed	0	20.0	0	20.0	0	20.0	0	20.0	0	20.0
	Nonimputed	2373	0.9	13737	5.1	6071	2.3	2759	1.0	242661	90.7
	Overall	2373	0.9	13737	5.1	6071	2.3	2759	1.0	242661	90.7
NV	Imputed	146	5.7	75	2.9	191	7.4	70	2.7	2089	81.3
	Nonimputed	5410	3.3	16514	10.0	12943	7.9	3279	2.0	126697	76.9
	Overall	5556	3.3	16589	9.9	13134	7.8	3349	2.0	128786	76.9
NH	Imputed	1674	1.1	1387	0.9	1421	0.9	379	0.2	151544	96.9
	Nonimputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Overall	1674	1.1	1387	0.9	1421	0.9	379	0.2	151544	96.9
NJ	Imputed	0	20.0	0	20.0	0	20.0	0	20.0	0	20.0
	Nonimputed	37737	3.5	201755	18.5	113872	10.4	1295	0.1	735532	67.5
	Overall	37737	3.5	201755	18.5	113872	10.4	1295	0.1	735532	67.5
NM	Imputed	2569	0.9	6452	2.2	128088	44.6	28802	10.0	121323	42.2
	Nonimputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Overall	2569	0.9	6452	2.2	128088	44.6	28802	10.0	121323	42.2
NY	Imputed	103477	4.0	515082	20.1	389220	15.2	6519	0.3	1553166	60.5
	Nonimputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Overall	103477	4.0	515082	20.1	389220	15.2	6519	0.3	1553166	60.5
NC	Imputed	0	0.0	4	100.0	0	0.0	0	0.0	0	0.0
	Nonimputed	7507	0.7	328655	30.3	4830	0.4	17756	1.6	725893	66.9
	Overall	7507	0.7	328659	30.3	4830	0.4	17756	1.6	725893	66.9

Figure B.5- Imputed, nonimputed, and overall racial-ethnic counts and percentages, by state: 1987-88 CCD school data—Continued

State		Asian/Pacific Islander		Black		Hispanic		Native American		White	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
ND	Imputed	0	20.0	0	20.0	0	20.0	0	20.0	0	20.0
	Nonimputed	816	0.7	755	0.6	718	0.6	5931	5.0	110298	93.1
	Overall	816	0.7	755	0.6	718	0.6	5931	5.0	110298	93.1
OH	Imputed	0	20.0	0	20.0	0	20.0	0	20.0	0	20.0
	Nonimputed	14608	0.8	256000	14.3	20124	1.1	1813	0.1	1495019	83.6
	Overall	14608	0.8	256000	14.3	20124	1.1	1813	0.1	1495019	83.6
OK	Imputed	0	20.0	0	20.0	0	20.0	0	20.0	0	20.0
	Nonimputed	6435	1.1	57224	9.8	13457	2.3	61585	10.6	443889	76.2
	Overall	6435	1.1	57224	9.8	13457	2.3	61585	10.6	443889	76.2
OR	Imputed	7	17.1	6	14.6	16	39.0	12	29.3	0	0.0
	Nonimputed	12235	2.7	10849	2.4	14821	3.3	7349	1.6	408547	90.0
	Overall	12242	2.7	10855	2.4	14837	3.3	7361	1.6	408547	90.0
PA	Imputed	0	20.0	0	20.0	0	20.0	0	20.0	0	20.0
	Nonimputed	22762	1.4	215587	13.2	38573	2.4	1151	0.1	1354331	83.0
	Overall	22762	1.4	215587	13.2	38573	2.4	1151	0.1	1354331	83.0
RI	Imputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Nonimputed	3598	2.7	8007	6.0	6262	4.7	483	0.4	115388	86.3
	Overall	3598	2.7	8007	6.0	6262	4.7	483	0.4	115388	86.3
SC	Imputed	42	0.9	1467	32.5	20	0.4	11	0.2	2967	65.8
	Nonimputed	3388	0.6	250247	41.1	1397	0.2	738	0.1	353730	58.0
	Overall	3430	0.6	251714	41.0	1417	0.2	749	0.1	356697	58.1
SD	Imputed	717	0.6	722	0.6	1507	1.2	11256	8.9	112319	88.8
	Nonimputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Overall	717	0.6	722	0.6	1507	1.2	11256	8.9	112319	88.8
TN	Imputed	3	0.1	1297	59.0	2	0.1	0	0.0	898	40.8
	Nonimputed	4889	0.6	180296	22.0	1503	0.2	372	0.0	634092	77.2
	Overall	4892	0.6	181593	22.1	1505	0.2	372	0.0	634990	77.1
TX	Imputed	11970	16.2	40195	54.6	7190	9.8	2286	3.1	12028	16.3
	Nonimputed	59593	1.8	472487	14.6	1016570	31.5	5221	0.2	1672287	51.8
	Overall	71563	2.2	512682	15.5	1023760	31.0	7507	0.2	1684315	51.0
UT	Imputed	2	40.0	0	0.0	3	60.0	0	0.0	0	0.0
	Nonimputed	7362	1.8	1939	0.5	15243	3.7	5580	1.3	386821	92.8
	Overall	7364	1.8	1939	0.5	15246	3.7	5580	1.3	386821	92.8
VT	Imputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Nonimputed	468	0.5	379	0.4	162	0.2	432	0.5	90600	98.4
	Overall	468	0.5	379	0.4	162	0.2	432	0.5	90600	98.4

Figure B.5- Imputed, nonimputed, and overall racial-ethnic counts and percentages, by state: 1987-88 CCD school data—Continued

State		Asian/Pacific Islander		Black		Hispanic		Native American		White	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
VA	Imputed	27606	2.8	221230	22.6	26729	2.7	2238	0.2	700068	71.6
	Nonimputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Overall	27606	2.8	221230	22.6	26729	2.7	2238	0.2	700068	71.6
WA	Imputed	0	20.0	0	20.0	0	20.0	0	20.0	0	20.0
	Nonimputed	39114	5.0	31057	4.0	34672	4.5	18589	2.4	652520	84.1
	Overall	39114	5.0	31057	4.0	34672	4.5	18589	2.4	652520	84.1
WV	Imputed	1431	0.4	13565	3.8	675	0.2	188	0.1	342169	95.6
	Nonimputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Overall	1431	0.4	13565	3.8	675	0.2	188	0.1	342169	95.6
WI	Imputed	1798	13.0	2781	20.0	2845	20.5	6073	43.8	378	2.7
	Nonimputed	11331	1.5	65165	8.4	16783	2.2	9090	1.2	669993	86.7
	Overall	13129	1.7	67946	8.6	19628	2.5	15163	1.9	670371	85.3
WY	Imputed	636	0.6	812	0.8	5690	5.8	2384	2.4	89277	90.4
	Nonimputed	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Overall	636	0.6	812	0.8	5690	5.8	2384	2.4	89277	90.4

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